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COMPUTERWORLD

OS updates shut down some clones

OS/2, Windows require quality memory chips

BY CHRISTOPHER LINDQUIST
CW STAFF

OS/2 2.0 and Windows 3.1 both push hardware hard, and some systems are snapping under the strain. The weakest link, according to Microsoft Corp., IBM and some users, is memory.

Problems related to memory chips have made it impossible to install IBM's OS/2 2.0 on some systems, particularly the low-priced ones. Other clones have been barraged with potentially data-robbing memory parity errors under Microsoft's Windows 3.1.

Although the problems do not appear to be widespread among the upper-tier hardware vendors, they could become more frequent as price-sensitive buyers continue to purchase systems from the lower rungs.

Such systems currently have an installed base of some 8 million to 10 million computers, according to William Ablondi, vice president of desktop strategies at BIS Strategic Decisions in Norwell, Mass.

A number of Windows 3.1 users have reported memory problems. Microsoft said the memory parity errors are almost certainly indications of problems with hardware, not software. Some users are skeptical, however, as memory-testing packages often report no errors, and replacing memory does not guarantee improvement.

Parity errors can cause data loss under Windows 3.1 as well, according to some users. When an error occurs, the system may have to be rebooted, despite

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Clustering to turbocharge RS/6000

Denser chip sets will boost processing into the hundreds of MIPS, IBM says

BY MARYFRAN JOHNSON
CW STAFF

PALM SPRINGS, Calif. — IBM laid out ambitious plans for providing enormously powerful, high-end, Unix-based computing last week, including a new offering of clustered RISC System/6000s and assurances of a 1993 delivery for the first RS/6000-based highly parallel supercomputers.

An estimated 800 scientific and technical computer managers who gathered at IBM's Technical Computer Industry Executive Conference here also got a preview — without delivery dates — of the next generation of the RS/6000 chip set. The design densely packs multiple chips onto one module and is expected to boost performance into the hundreds of millions of instructions per second range, said Phil Hester, vice president of IBM's Advanced Workstations Division in Austin, Texas.

IBM will initially market high-end Unix systems to scientific and technical users who are more comfortable building their own software. The company intends to proceed more cautiously with commercial accounts, many of which will not require such hot boxes for at least two years, IBM officials said.

Although users seemed gratified to hear about IBM's longer term vision, they tended to focus more on the here and now.

"I'm interested in how we apply all this technology to a diverse organization and how to use it so we stay flexible," said

Continued on page 16

Sizzling systems

IBM's plans for the RS/6000 include the following:

- Loosely clustered systems that will use the 1G bit/sec. fiber channel standard.
- 3D graphics boost via GT4, GT4X cards.
- Software to facilitate high-availability operation.

CW Chart: Janell Genovese

INSIDE OUTSOURCING

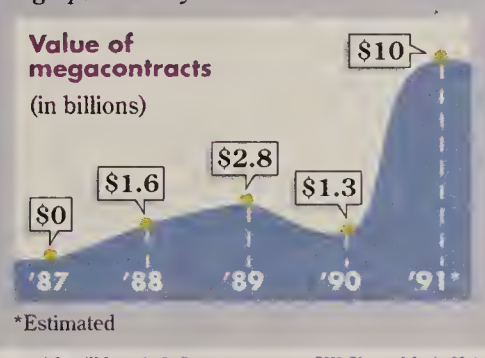
Early adopters give qualified approval, but urge IS to keep its hands on the reins

BY NELL MARGOLIS
and CLINTON WILDER
CW STAFF

In the three years since IBM and Eastman Kodak Co. catapulted "outsourcing" into the information systems lexicon, the niche has turned into a booming market. Outsourcing pioneers are advising the uninitiated to proceed — but with caution.

Recent interviews with IS executives at some of the leading companies that have outsourced their data processing, such as H. J. Heinz Co., National Car Rental System, Inc. and Hibernia Bancorp, revealed a high degree of satisfaction so far. And early market research shows that their upbeat assessment is no exception (see chart).

Tidal wave
The value of outsourcing contracts hit a high point last year



Source: Merrill Lynch & Co. CW Chart: Marie Haines

But are outsourcing's happy campers bunking in a fool's paradise? Gateway Information Services, Inc., a New York-based management consulting firm, thinks so. Ten-year outsourcing pacts are being signed at a time when most of the major commercial users interviewed by Gateway are reluctant to project technological and economic trends more than two years ahead. Gateway President Gerald Manganelli predicted that in a few years, users will rush to bail out of outsourcing deals as unforeseen developments turn their early-'90s dream deals into mid-'90s nightmares.

Despite these red flags, many of outsourcing's early adopters say there is plenty users can do to weight the odds in

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Chemical Bank cashes in on consolidation

BY ELISABETH HORWITT
CW STAFF

NEW YORK — Chemical Banking Corp. is working overtime to consolidate network and data center management in a bid to cut $66 million in annual costs by 1994.

That figure, 9% of the overall savings expected from the bank's belt-tightening during the next two years, will be achieved in part by shaving about 560 people from an information systems operation of about 1,700. In addition, the bank expects to realize savings from ongoing consolidation and automation of its data centers and networking operations.

Mayer's IS *revamp builds on previous efforts*

Chemical's anticipated savings come with a stiff price tag, however. Last year's acquisition of Manufacturers Hanover Corp. — the largest in banking history — has already cost Chemical a fourth-quarter 1991 pretax restructuring charge of $625 million. Total annual net income for the combined companies was $779 million last year.

However, an expected overall savings from the merger of $750 million per year by 1995 more than makes up for the restructuring charge, said James Mayer, senior vice president at Chemical's Information and Technology Management Division.

Six months before the acquisition was finalized, Mayer's group sat down with its Manny Hanny counterparts to hammer out a consolidated IS structure that would offer data center and networking services as centrally managed utilities, Mayer said.

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NEWSPAPER

INSIDE

David Barrett, VP of systems at Invesco Funds Group, leads the firm's charge into open systems. Page 6.

IBM moves closer to a Notes-based OfficeVision LAN strategy. Page 4.

Built-in desktop security could cause confusion. Page 10.

Product Spotlight — What's a Unix server? Almost anything you want it to be. Page 63.

IN THIS ISSUE

Quotable

"I can argue that we're a victim [of the recession], but companies that make cuts suggested by [the] press and analysts to meet economic conditions don't last very long."

KENNETH H. OLSEN
DEC

On the health of his company.
See story page 14.

The 5th Wave

"WELL, MR. BOND, I GUESS THIS IS FAREWELL. LOWER...THE...LASER...PRINTER!"

EXECUTIVE BRIEFING

■ **IBM sets the table for RISC supercomputing,** announcing plans to deliver clustered RS/6000 workstations and an RS/6000-based parallel supercomputer during the next two years. Users like the idea but want to see more deliverables and fewer plans. **Page 1.**

■ **Many of today's client/server environments resemble traditional timeshare setups** rather than distributed powerhouses. Reliance on a central server creates a bottleneck that slows processing. But careful partitioning of the processing load between client and server and downtime contingency plans can make the best of the situation. **Page 83.**

■ **PC clone buyers beware!** Some users are reporting crashes because of parity error problems running Windows 3.1 and OS/2 2.0 on their clone machines. Microsoft and IBM say the problem is cheap memory chips, and they advise users to upgrade their memory. **Page 1.**

■ **The first user of NCR's parallel processing System 3600** says the product's scalability persuaded him to migrate to the Unix-based system from two overloaded DG MVs. **Page 6.**

■ **Chemical Bank is getting help** with the mammoth task of consolidating its IS with that of Manufacturers Hanover by becoming a test bed for IBM and DEC's system and network management platforms, SystemView and Polycenter. **Page 1.**

■ **DEC users are upbeat about the vendor's Microsoft alliance,** judging by interviews at last week's DECworld '92. While few are committing to migrating to Windows NT on Alpha just yet, they like the incentives DEC is offering. **Page 14.**

■ **Future versions of Windows and OS/2** will have built-in security features. Users like the idea of having additional protection, but some fear it could add more confusion to an already complex security systems web. **Page 10.** IBM may finally clear up its OfficeVision LAN strategy by revealing a tighter relationship with Lotus that would position Notes as the key LAN platform to IBM's office strategy. IBM quietly discontinued plans to ship a Release 2 of Officevision LAN last year. **Page 4.**

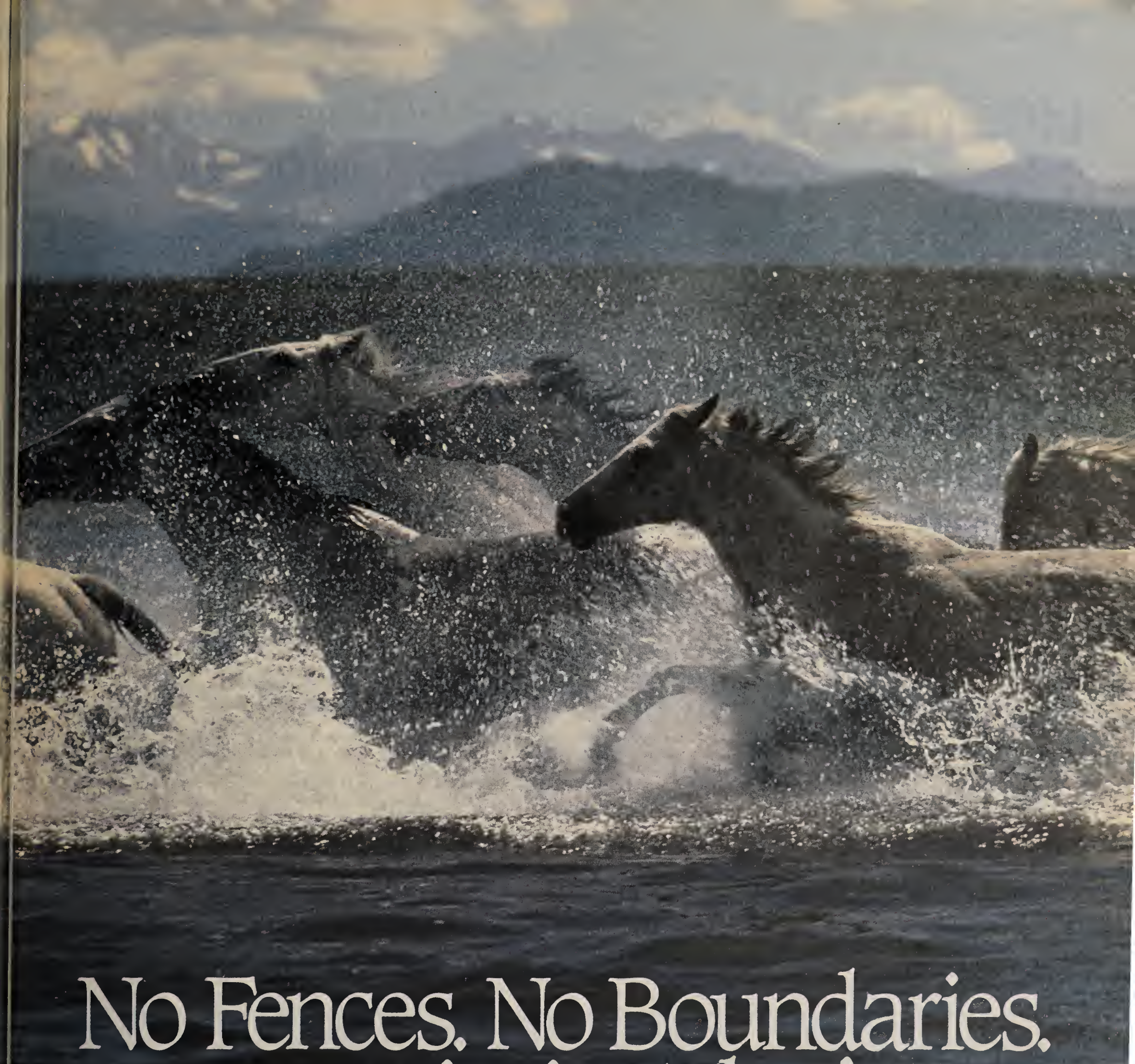
■ **IBM and Compaq may be locked into their high-ticket images.** Some users question whether Compaq can maintain quality with low-priced machines and whether IBM's MCA restricts it from the commodity market. **Page 33.**

■ **Apple is ready to push into consumer electronics.** Later this month, it is expected to preview an inexpensive, handheld computer that some sources say is the firm's most exciting product since the Macintosh. **Page 33.**

■ **FDDI gains a new platform with its introduction to the IBM PS/2 market.** The high-speed networking technology was added to MCA machines by Network Peripherals. **Page 39.**

■ **National ISDN is ready to take another step forward** as telephone companies prepare to receive gear that conforms with the common specifications developed by Bellcore. **Page 45.**

■ **On site this week:** Putting the squeeze on vendors is one strategy that Pat Thomas, MIS director at furniture maker Hickory White, is using to guide his company through an open systems migration. Thomas wants the vendors to play by his rules, such as the one that says they have to use his applications in benchmark tests. **Page 87.** Caution is the word at Sanwa Bank California, as the U.S. consumer banking arm of a major Japanese bank tries to balance the need to provide computing power with surviving the recession. **Page 51.** Computers help keep Matson Navigation's ships on schedule and play an increasingly important role in helping the cargo handler keep its customers up to date on their shipment's status. **Page 45.**



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OfficeVision, Notes pact nears

IBM, Lotus could finally answer users' pleas for a robust office system

BY ROSEMARY HAMILTON
CW STAFF

WHITE PLAINS, N.Y. — IBM may be inching closer to making a major shift in its troubled OfficeVision initiative. The company is expected to soon anoint Lotus Development Corp.'s Notes workgroup software as the key local-area network platform under its office strategy, sources said last week.

IBM would neither confirm nor deny if negotiations are under way, but Robert Weiler, a senior vice president at Lotus, said the two companies are "in discussions" and that "the results should be announced shortly." However, he also insisted that terms had not been finalized and that it will be "IBM's call" to explain the outcome.

"We meet with Lotus on a regular basis considering how we can enhance the relationship on Notes and CC:Mail," said Charles Jones, IBM's manager of LAN office marketing. "I don't want to call those negotiations. We have ongoing meetings."

IBM and Lotus signed a deal in June 1991. The two are working to plug Notes technology into the OS/2 platform. IBM also markets Notes and CC:Mail, Lotus' electronic-mail software. If the deal goes through, it could benefit users who are looking to IBM to provide a robust LAN office system, something it has struggled to do since announcing OfficeVision in 1989.

"To be really truthful, I think Notes probably has more potential for being a real product for us than OfficeVision," said Chris Waldron, senior information systems analyst at Hershey Foods Co. in Hershey, Pa., which continues to evaluate office automation products.

But it is unclear how Lotus' Notes will help the overall OfficeVision concept. After two years of confusion — the trouble began around March 1990 with OfficeVision's first announced delay — the IBM strategy has little appeal for customers.

"Right now, we are unclear about what their future OfficeVision LAN strategy is," said Keith Sievers, a vice president and treasurer at Federal Kemper Insurance Co. in Decatur, Ill., which was a test site for the initial OfficeVision LAN product. IBM used the firm in early promotional efforts. "We probably are moving away from OfficeVision and looking at alternative solutions."

Royal Bank of Canada is another site that tested OfficeVision, and it has abandoned its plans for it. "We have not moved along into OfficeVision on the mainframe and obviously not on the LAN," said Peter Rakoczy, manager of office systems development. "Our strategy is to get off the mainframe altogether for office systems. We are evaluating Notes now anyway and will likely go into pilot with it in the summertime."

Hammering out details

Several observers contacted said they believe IBM and Lotus were hashing out the final details that would extend their relationship, which was officially announced in June 1991. In addition to reselling Notes and CC:Mail, IBM continues to sell its own OfficeVision 2 LAN Release 1 software. This current LAN platform includes the office functions but is missing some key components, such as the direct connection to OfficeVision host platforms.

IBM already considers Notes and CC:Mail strategic OfficeVision components, Jones said. But he refused to comment on the possibility of these products moving ahead of IBM's.

However, Donna Little, information center manager at Motorist Insurance Co. in Columbus, Ohio, said the company's IBM systems engineer had informed her staff that "Notes is the way to go" for an office LAN system. Motorist Insurance is a devoted OfficeVision MVS user and has a longer range plan to add a LAN component to it.

Some customer sites with both Lotus and IBM software said a tighter relationship between the two firms could help.

"If this happens, Lotus' Notes will become IBM's strategic desktop platform for office [systems], and that has major implications for any corporation that lives with multiple desktop products," said Craig Goldman, chief information officer at The Chase Manhattan Bank NA in New York, which has installed Notes on hundreds of desktops.

Arthur Andersen, a key Lotus account with plans to install at least 20,000 copies of Notes, raised some concerns about IBM becoming too involved in Notes development.

"If IBM starts changing the priorities and starts adding the IBM bureaucracy [to Notes development], then that could start slipping the delivery dates," said Richard Stuckey, a partner at Arthur Andersen.

Office myopia

Amid speculation about a closer IBM/Lotus relationship, the confusion continues regarding the future of IBM's OfficeVision LAN offering.

IBM is being very careful about how it positions any future Notes role in the OfficeVision strategy. OfficeVision was the first big Systems Application Architecture (SAA) initiative announced. OfficeVision and subsequent SAA frameworks have become critical to IBM's overall strategy.

In an interview last week, Charles Jones, the company's manager of LAN office marketing, said IBM has not pulled the plug on OfficeVision 2 LAN Release 1. "There are no plans to withdraw OfficeVision 2 LAN marketing or support," he said. "That isn't saying we won't clarify that more."

However, Robert Weiler, a senior vice president at Lotus, said, "The words they use are not 'kill' and 'die.' The message is the software is stabilized. Maybe it will move into the background [and] maybe not get updated as much."

Jones also revealed that IBM quietly announced —nearly a year ago — that it would not deliver Release 2 of the LAN product, "as previously announced" in May 1989. This major change was delivered via a customer letter dated July 30, 1991. Release 2 was supposed to contain more robust office features as well as various other functions, including direct connections to the OfficeVision host platforms.

Beginning in late 1990, IBM began shifting gears with the LAN features, and the lines between Release 1 and Release 2 began to blur. Features that had once been associated with Release 2, such as the direct connection to the host, were now discussed as enhancements for Release 1. At the same time, the firm began talking about new features, such as Microsoft Corp.'s Windows support, that would also be announced as Release 1 enhancements.

In June 1991, IBM said it still intended to ship the host connection as well as a 32-bit version of OfficeVision LAN for Release 1. Last week, Jones said IBM is still committed to this plan, although he cannot yet provide a delivery date.

ROSEMARY HAMILTON

IBM considers selling systems via direct mail

BY CAROL HILDEBRAND
CW STAFF

WHITE PLAINS, N.Y. — After months of discussion, IBM appears to be on the verge of sticking its toe into the mail-order channel. According to sources close to the company, not only is IBM involved in acquisition talks with Northgate Technologies, Inc., but it is also moving to sell some entry-level Personal System/2s through direct mail.

While pushing the PS/2 Models 35 and 40 into mail-order distribution would mark a step forward in IBM's efforts to hone its competitive edge, analysts said the Northgate deal offers the only real chance to compete at the low end.

"The only way to somewhat profit from the low-end market would be through some outside vendor, to isolate it from IBM corporate," said Kimball Brown, director of personal computer hardware research at International Data Corp. in Mountain View, Calif.

Despite recent price cuts on the Models 35 and 40, analysts said IBM still cannot compete with low-end vendors. However, prices on the IBM boxes will reportedly take another dive — to the sub-$1,500 mark — with the mail-order announcement. Sources said they expect that announcement within the next two weeks.

Separately, the Northgate announcement should come during the next week, sources said. Although both IBM and Northgate acknowledged that they were in discussions with a number of vendors, neither company would comment more specifically.

Northgate, the Eden Prairie, Minn., PC maker, sells most of its PCs through the direct channel. Scott Stein, director of PCs and workstations at Technology Investment Strategies Corp. in Framingham, Mass., said that although Northgate experienced a cash shortfall because of its move to build a direct sales force, the company remains viable. "All they need is a dose of credibility," which an IBM label on the box would help provide, Stein said.

Stein nixed the concept of selling the machines under a non-IBM label: "If you go and OEM the things out, IBM just becomes a major dealership."

Lotus acquires The Organizer

BY ROSEMARY HAMILTON
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. moved into the Windows-based personal information manager (PIM) market last week, but not with its Agenda, a leading PIM in the DOS world. Lotus instead acquired The Organizer from Threadz Ltd. in the UK.

The Organizer for Windows is scheduled to begin shipping in the third quarter. Terms of the acquisition were not released.

Lotus said it will continue marketing Agenda for DOS users, primarily as a "stand-alone product," according to Paul Paget, director of marketing at the portable computing group. He said the company decided Agenda "was built for DOS and not easily moved" to Microsoft Corp.'s Windows.

PIM provides various personal office features, such as calender, address list and note-taking functions. In addition, Agenda offers text management functions that allow users to scan through notes as well as to import and export text to and from outside sources.

Dan Hogan, president of The Apollo Group, a management consultancy in Concord, Mass., is a longtime Agenda user who received a copy of The Organizer last week. Hogan said he plans to use both products. The Organizer is good for calendaring and "simple to-do lists," while Agenda has better text management, he said.

While he said he would like to use only one PIM instead of two, Hogan said he thinks Lotus is "making the right move" by introducing a graphical PIM.

"It would be great if there was a Windows version of Agenda," Hogan said. "People who need the power of Agenda will continue to use it, but it's great to have a tool like The Organizer," he added.

Paget said Lotus will improve certain Organizer features in a second release due out by year's end. When the Organizer ships, Lotus also plans to release a conversion utility for Agenda users who want a Windows-based PIM.

Paget estimated that Agenda has built up a user base of about 125,000 since it first shipped in July 1988.

Largest worldwide RDBMS market share: 30% -Gartner Group

Fastest benchmark ever: 1,073 tpsB -Codd & Date

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Fastest benchmark on a VAX 6560: 153 tpsB -Codd & Date

Largest worldwide DEC VAX VMS RDBMS market share: 51% -Gartner Group

Fastest benchmark on an IBM-compatible mainframe: 416 tps -Codd & Date

Largest worldwide MS-DOS and OS/2 RDBMS market share: 41% -Gartner Group

Fastest benchmark on a UNIX minicomputer: 319 tpsB -Codd & Date

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NEWS SHORTS

IS works through LA rioting

In the aftermath of angry reaction to the acquittals in the Rodney King police brutality trial, the city of Los Angeles' data processing center, which handles fire and police dispatching, worked under police guard. A citywide curfew precluded third-shift workers from reporting to work last Wednesday or Thursday, forcing others to work 12-hour shifts. Hundreds of fires and thousands of police reports swamped a bank of seven Digital Equipment Corp. PDP-11/70s used for dispatching. The city's IBM 3090 mainframes transferred data on riot and looting arrests to Los Angeles County computers. Also, communications links between the Los Angeles Water Department's data center downtown and its offices in South Central Los Angeles, the site of many fires, were down. Interviews with some area data center staff revealed they remained in operation but worked reduced hours.

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Bill would repeal Section 1706 act

A package of employment tax reforms that includes the repeal of Section 1706 of the Tax Reform Act of 1986 was introduced last week by Rep. Doug Barnard Jr. (D-Ga.) and two co-sponsors. The controversial Section 1706 applies a 20-question test to determine whether programmers provided by technical service firms are classified as employees or independent contractors [CW, March 25, 1991]. The repeal bill, H.R. 5011, was welcomed by the National Association of Computer Consultant Businesses, which is battling with the pro-Section 1706 forces of the Information Technology Association of America.

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20/20 for Windows and Motif

Computer Associates International, Inc. plans to introduce a Microsoft Corp. Windows version and an Open Software Foundation Motif version of its 20/20 spreadsheet this week at Dexpo East '92. CA-20/20 for Windows is scheduled to ship to beta-test sites in the fourth quarter, while CA-20/20 for Motif will move into a beta-test program in the first quarter of 1993.

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Sara Lee unit turns to outsourcing

Martin Marietta Corp. signed a $7.9 million, multiyear outsourcing contract with PYA/Monarch, Inc., a Greenville, S.C.-based division of Sara Lee Corp. Martin Marietta Information Systems, a unit based in Orlando, Fla., will handle data processing and technology upgrades, sparing the food distributor the need to maintain an in-house computer center. PYA/Monarch will continue to develop applications software in-house.

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NCR reels in big Ameritech sale

NCR Corp. last week made one of its largest System 3000 sales to date, when Ameritech Corp. agreed to install approximately 6,000 NCR 3320 workstations and 100 NCR 3445 and 3447 network servers throughout 80 customer service centers. Terms were not disclosed. NCR's 3320 workstation list price ranges from $2,095 to $2,795; pricing for the 3445 and 3447 servers is about $19,000 and $23,000, respectively.

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Short takes

Tsun Shin Chow, a department head at **AT&T Bell Laboratories** in Naperville, Ill., was named "Data Center Manager of the Year" by the **Association for Computer Operations Manager.** . . . The **IBM** team that invented reduced instruction set computing was named "Inventor of the Year" by Intellectual Property Owners, Inc., a Washington, D.C.-based association. The team consisted of John Cocke, George Radin, Norman Kreitzer and Francis Carrubba. . . . Frank T. Cary, 43-year veteran and former chairman and chief executive officer of IBM, was elected to the board of Riverwoods, Ill.-based **SPS Transaction Services, Inc.** . . . Former Ashton-Tate Corp. Chairman and CEO **William Lyons** has been named president and CEO of **ParcPlace Systems** in Mountain View, Calif. ParcPlace founder **Adele Goldberg** remains as chairman of the board. . . . **Central Point Software, Inc.** filed an initial public offering of 3 million shares of common stock. The offering price is expected to be $11 to $13 a share.

More news shorts on page 16

Invesco buys into NCR Unix strategy

BY ELLIS BOOKER
CW STAFF

DENVER — Up to now, America's only user of an NCR Corp. System 3600 has been NCR's internal information systems department in Dayton, Ohio.

But that will change early next month, when Invesco Funds Group, Inc., a rapidly growing mutual funds firm here, receives its 3600, a loosely coupled, parallel-processing Unix system that will both relieve the firm's capacity crunch and realize the IS department's open systems goal.

"We've tripled our number of accounts in the past year and a half [to 600,000]," said Dan Hesser, president of the 60-year-old mutual funds company, explaining the need for more computing horsepower.

The 3600 will trigger the retirement of two out-of-capacity Data General Corp. MV 10000 minicomputers that have traditionally handled all of the company's core business systems, from accounting and customer records to applications that manage $6 billion worth of mutual fund portfolios.

Invesco's Barrett: *'The cutover [to 3550] went beautifully'*

As an interim step two weeks ago, Invesco installed the just-announced NCR System 3550, a symmetric multiprocessor system, to take over the processing load from one of the two 3-year-old DG minicomputers. Invesco's shareholder database is now running on the 3550. "The cutover went beautifully," said David Barrett, vice president of systems. He said some 200 of the 380 users who will eventually connect to the 3600 are now on the 3550.

Invesco's growth is fueling its move to open systems: Since 1990, the company's sales have almost tripled to $2.8 billion last year. To manage this growth, an extremely scalable system seemed to be the only answer, Barrett said. That is also the reason he decided against trading up to a DG Aviion Unix system, he said. "We felt we'd outstrip an Aviion machine within a year," he said.

Barrett said he anticipates that the eight-processor 3600 — which lists for about $1.75 million — will last two to three years, "at which point we have an option of adding processors." Scalability is so key that Barrett's contract with NCR stipulates that he will test this feature during the coming months before signing off on the machine.

Like many commercial users making the jump to a Unix platform, Invesco first plans to port its Cobol programs to run under Unix. The migration was made easier with a Cobol interpreter called Choice, from Wild Hare Computer Systems, Inc. According to Barrett, a production version of the shareholder database was ready just 40 days after the 3550 arrived.

Living in parallel worlds

Running Unix V.4MP, the System 3600 represents one of the two models at the top of the scalable, seven-level System 3000 family

Key features include:

- A loosely coupled parallel processor, scalable up to several hundred Intel 50-MHz, I486 processors.
- Scalable to 10,000 million instructions per second.
- Uses Ynet, an intelligent, message-passing bus system that operates at 6M bytes per second. The system was developed by Teradata, which NCR's parent AT&T acquired in February.
- Generally available in July.

NCR users with open systems say no gain without pain

BY ELLIS BOOKER
CW STAFF

ATLANTA — When it unveiled its System 3000 in September 1990, NCR Corp. put its customers on alert that open systems and Unix were in their futures.

During the past year, many of those users — seeing the writing on the wall for their proprietary I and V series mainframes — have taken the plunge into Unix.

Several attendees at the last annual meeting of the Federation of NCR User Groups here said they had recently migrated or were very close to doing so.

But that is not to say the moves were simple or painless. "Industry standards are not as standard as you'd think," said Donald K. Whittington, MIS manager at Saginaw, Mich.-based Michigan Sugar Co., who late last year moved 1,500 Cobol applications from his NCR 9500 mainframe to a System 3000 Model 3445.

Pleased user

Despite having to handle system crashes caused by subtle incompatibilities between peripherals and software device drivers and dealing with multiple hardware and software vendors, Whittington said he is happy with the end result. "We're saving tens of thousands a year," Whittington said, noting that the firm should realize a payback for the system in less than 18 months.

Other users at last week's Nucon:92 conference emphasized the sheer power boost of the new systems, which most are using to run old, Cobol-based applications. "We had one batch job that took an hour and 18 minutes that we can now run in one minute and 16 seconds," said Glenn S. Rice, director of data processing at Maier's Sunbeam Bakery, a baked goods manufacturer in Reading, Pa.

NCR currently offers two migration approaches: Galaxy for its I series customers and Union for its V series and Unix-based Tower users.

But running Cobol on a Unix system is only half the game, said Steve Rampley, the systems analyst for the clerk of the Circuit Court in Seminole County, Fla. Rewriting those applications "is a bitter pill that everyone is eventually going to have to swallow," said Rampley, who intends to use Informix Software, Inc.'s fourth-generation language for an integrated application on his NCR 3345 and 3445.

FileNet to use IBM RS/6000

BY ELLIS BOOKER
CW STAFF

COSTA MESA, Calif. — Pulled into the marketplace by the irresistible force of open systems, FileNet Corp. is scheduled to announce today an agreement to resell IBM's RISC System/6000 line as Unix servers for its popular document imaging system.

The reduced instruction set computing (RISC)-based RS/6000 implementation will be available starting in the fourth quarter, FileNet said.

Since early 1991, when FileNet announced support for personal computers under Microsoft Corp.'s Windows environment as an option to its own proprietary Unix clients, analysts have predicted the company would open up the server end of its imaging system.

"The net result is that everyone wins here, with the possible exception of [FileNet's] competition," said Pam Bliss, senior industry analyst of document imaging service at Dataquest, Inc. in San Jose, Calif.

Bliss suggested the lack of an industry-standard Unix server in FileNet's architecture had kept it out of some accounts, a point even FileNet's vice president of marketing, Jordan M. Libit, conceded last week.

"It was apparent two years ago that it was prudent for us to exploit the technology from a firm that does much more R&D than we do," Libit said.

But FileNet also seems keenly interested in retaining the goodwill of its existing accounts by offering plenty of expansion room on the proprietary line.

Thus, in conjunction with its Series 6000 announcement, FileNet will introduce a new proprietary server, the Series 5000. Based on the Motorola, Inc. 68040 microprocessor, the Series 5000 is said to give two to four times the performance of the current line and is available to current customers as a board-level upgrade.

In addition to the server announcements, FileNet will unveil a version of its Image Management Services server that runs under AIX, the RS/6000's Unix implementation.

FileNet will also enhance its client software — notably the ability to incorporate SQL database calls into WorkFlo scripts and the ability to send LU6.2 commands from a WorkFlo application.

Pricing

▶ The FileNet Series 5000 is available immediately at a base price of $49,000. Upgrading from the earlier Series 1000/3000 or Series 4000 costs $90,000 and $55,000 (per server), respectively.

▶ The FileNet Series 6000 RISC server ranges in price from $39,000 to 64,000; the AIX version of the Image Management Services server software ranges in price from $206,600 to $474,495.

GE opts for CA enterprise licensing plan

BY THOMAS HOFFMAN
CW STAFF

ISLANDIA, N.Y. — On the heels of its recent software pricing revamp, Computer Associates International, Inc. announced last week that General Electric Co. has signed a major enterprisewide software license. Financial terms of the agreement were not released.

The deal allows GE, a large, longtime CA customer, to operate selected CA mainframe-based packages at any GE data center in North America. The $60 billion Fairfield, Conn.-based electrical conglomerate will also be permitted to relocate and upgrade CA mainframe-based software at no cost. The agreement includes a five-year maintenance provision and provides GE with free trial-testing of any other CA host software at any of GE's North American data centers.

"The application of information technology at GE is undergoing significant change as we seek to reduce costs and enhance value," Edward J. Skiko, vice president of corporate information technology at GE, said in a press release. He added that the agreement provides GE with the "flexibility in the software license process" as well as simplified software selection while stabilizing costs.

Other users plan on taking advantage of CA's new pricing schemes [CW, April 20].

David Moore, senior vice president at Mellon Bank Corp., said he met with CA representatives last week to discuss the new pricing policies. He said he is equally impressed.

"It's great. The issues of upgrading licenses by size and consolidation and the licensing issues raised therein show that CA has taken good points of contention raised by its customers," Moore said.

Control central focus of Afcom show

BY JOHANNA AMBROSIO
CW STAFF

NASHVILLE — Distribution of computer power throughout an organization is emerging as a key management issue for the 1990s as users wrestle with issues such as which group should administer to the care and feeding of those computers, and from what location.

The answer, according to attendees at a computer operations trade show here last week, is that it depends on the company, its culture and what exactly is being distributed.

While decentralized companies have been accustomed to divisions having their own data centers, other organizations are just now going through the exercise. Some are finding that relinquishing the data center's control does not work well but that getting it back can also be tough.

Attendees at the trade show, sponsored by the Association for Computer Operations Managers (Afcom), also chewed on other issues: running the data center like a minibusiness, which means following a strategic plan and adhering to tight cost restraints; automating the data center; selling a paperless environment to end users; and outsourcing.

Vendors, for their part, introduced new products designed to help data center employees get more operations information from more places, accessing it all on one workstation connected to the mainframe (see story below).

But control was one of the central issues of the show, with some computer operations managers — perhaps not surprisingly — taking the position that a centralized group is better than a distributed one. "It used to be that MIS used to take a hands-off view of [shared resources like] the servers and other end-user systems. But it is becoming our problem, and one which we must address," said Andrew Miller, director of information technology at McDonnell Douglas Helicopter Co. in Mesa, Ariz.

Miller said he is "marketing the concept" of bringing some of the distributed systems back into the data center. "Our customers still own the information and the data. But bringing the systems back into the glasshouse allows us to physically secure them and back them up." At the very least, he said, the operations group makes the pitch for central backup, even if the computers reside elsewhere.

Miller said he has met with "pretty good results, but a lot of people out there don't even want to talk to us. It's a real emotional issue." Nevertheless, of the 50-plus Digital Equipment Corp. MicroVAX machines in user departments, only some 23 remain. The rest have been either returned to the data center or upgraded to newer technology.

Centralized operations also make sense from a disaster recovery standpoint, said David Potemra, manager of computer processing at Dresser Industries, Inc. in Dallas. "When you distribute the physical data, it opens up many more areas of failure. We promote centralized processing environments," Potemra said. Nevertheless, he said, a few Dresser subsidiaries have their own data centers, and end-user departments administer their own local-area networks.

Managing change

The following were among the highlights of the Afcom computer operations trade show last week that focused on integrated systems management tools:

- **Legent Corp.** and **Landmark Systems Corp.** agreed to use Landmark's NaviGraph front end on a broad range of Legent's workstation-based packages. The deal will result in a workbench approach to the data center with a unified front end. Additionally, Landmark will team up with other vendors to include more products in the mix.
- **Candle Corp.** introduced a bidirectional interface between its Omegacenter data center software and IBM's NetView network management system.
- A rules-based package unveiled by **Systems Center, Inc.** allows operators to see the real-time status of both applications and system resources. Additional platforms will be added to the IBM mainframes currently supported.
- **Goal Systems International, Inc.** announced OPS/View, an OS/2-based system that coordinates data from Goal's OPS/MVS family of mainframe systems.
- A Unix-based package from which users can schedule mainframe jobs was announced by **4th Dimension Software, Inc.** in Costa Mesa, Calif. Other tasks and bridges to other platforms will be added.

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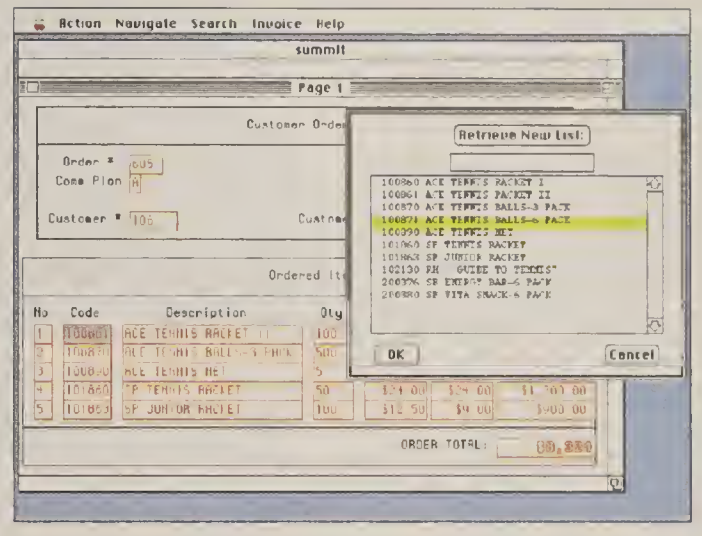
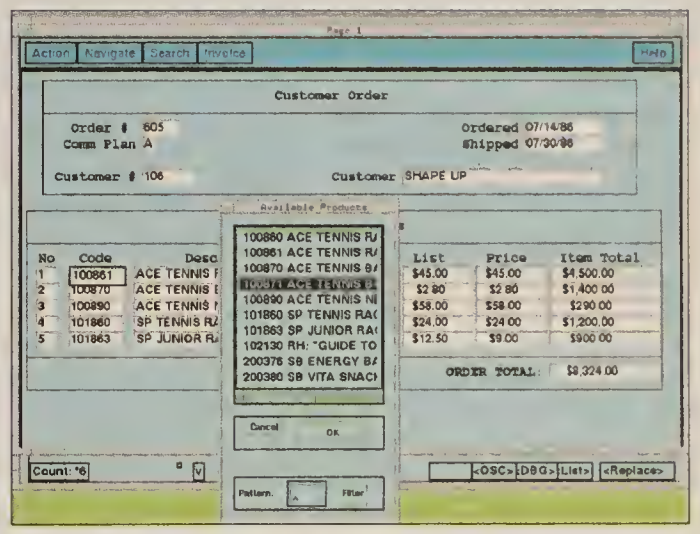


Macintosh



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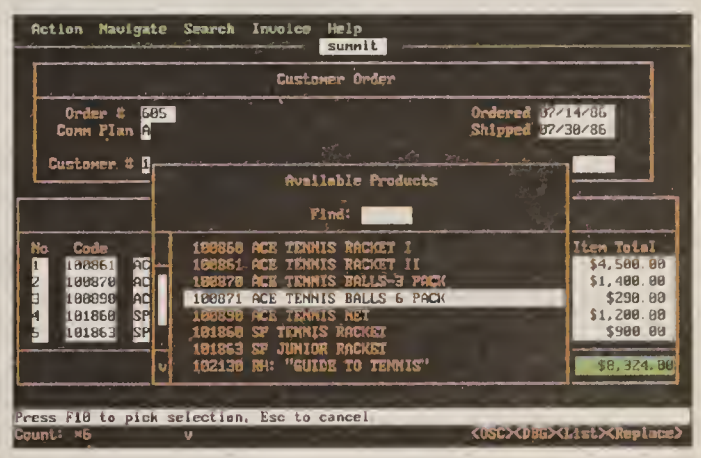
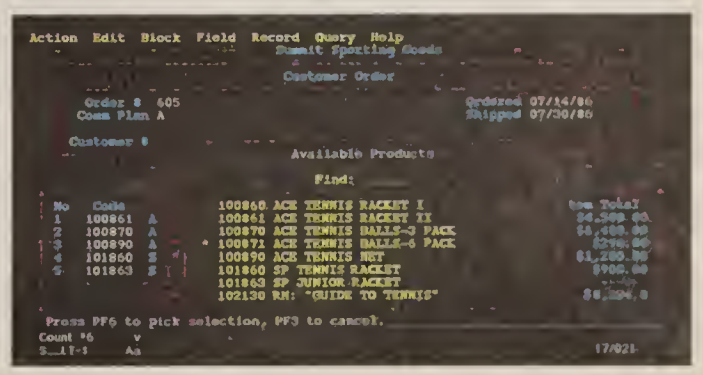


Character Mode



Block Mode

Desktop security in the works

BY ROSEMARY HAMILTON
CW STAFF

IBM and Microsoft Corp. plan to deliver future releases of their desktop operating systems with built-in security, a move that may both resolve and create problems for users.

The companies have projects under way to build in — as core functions of their operating systems — such features as access control, user authorization and auditing (see story at right).

Microsoft, for example, plans to deliver its security with the first release of Windows New Technology (NT), slated for later this year. IBM would not provide a specific time frame but said it will ship security functions as enhancements to a later release of OS/2 2.0.

At the Department of Commerce and Community Affairs for the state of Illinois, built-in security "would be extremely beneficial," said Ron Roy, manager of the division of information resource management and an OS/2 user.

"We know we are definitely at risk now, [but] to what extent is hard to define," Roy said. The department currently uses the "normal password protection," but a more robust security environment would "make me sleep easier," he added.

Several users said they do not believe their current security systems expose them to serious risk, but there is always room for improvement.

IBM agreed. "We have [OS/2] security today, where you enter a password," said Robert Heine, manager of the OS/2 program office at IBM. He conceded that it "would be possible to defeat that security fairly easily."

Adding a security layer to desktop operating environments, however, could confuse the already complex combinations of security programs and procedures at many user sites. On the desktop alone, a host of third-party vendors, such as Pyramid Development Corp., provide security systems for MS-DOS and IBM's OS/2. Beyond that, users rely on in-house-designed systems, local-area networks and larger system security.

Heading off trouble

While waiting for desktop operating systems to become more secure, users are employing the following:

Percent of respondents*
(Totol respondents: 1,102)

Separate microcomputers for testing	31.4%
Antivirus products	57.5%
Commercial access control software	43.5%
In-house control software	28.4%
File encryption	23.6%
Automatic disks backup	33.1%
Backup disks off-site	44.8%
Tempest-approved gear	11.6%

*Multiple responses ollowed

Source: Datapro Information Services Group

"I'm concerned [that] if everyone is building it into the operating systems, then how many different layers of security will I have to go through to get access to my information?" asked Patrick Adkisson, information services manager at Nordstrom, Inc. "If it's not all working together as one security system, data could be too difficult to get at."

Compatibility between the different security measures is also at issue. Both Microsoft and IBM acknowledged that their efforts should be coordinated with a user's overall security strategy but did not elaborate further. "We can't unilaterally solve everyone's problems," said Richard Barth, a Microsoft product manager for NT. "The first step is if you chose NT, we can guarantee very tight security."

Barth said an initial step will be to provide an application programming interface to the security module of NT that could be adopted by other security system developers.

The coordination issue is "really the challenge of the whole security question," Heine added. "It's beyond the issues of OS/2. There are aspects of System Applications Architecture that address security, so [our efforts] would be an attempt to work within that."

On the right track

One security analyst said IBM and Microsoft efforts are a step in the right direction. Charles Wood, a consultant at Information Integrity, a consulting firm in Sausalito, Calif., said security should be built into the operating system because "it's the least common denominator."

Yet Frank Michnoff, an analyst at Meta Group, Inc., wondered "which platform is going to be the primary security point or entry point to the rest of the organization?"

Despite the lack of long-range details, several users are encouraged by both vendors' plans to plug security functions into the operating systems.

Cary Serif, vice president of advanced technology at Huntington National Bank in Columbus, Ohio, said his company relies on third-party packages such as Pyramid's PC/DACS and its own internally designed security functions. The company recently designed an executive information system with security built in at the application level. It runs under OS/2.

"Longer term, I'd love to see OS/2 implement the type of security features you see in, say, an [IBM] MVS system," he said.

Classified secure

IBM and Microsoft are working to develop operating systems of C2 class, which is the federal government's classification for a basic level of security.

As defined by the National Security Agency's National Computer Security Center, C2 systems must include several security functions, including access control, identification and authorization procedures and audit processes. There are four levels of security classification, with A level being the most highly secure and D level representing minimum security.

Microsoft said it has designed Windows NT to have two primary privilege classifications: administrative and general user. Every object under NT has an associated access control list that can be read by the NT security manager.

Robert Heine, manager of IBM's OS/2 program office, said OS/2's improved security features would make use of data encryption techniques and audit trails.

ROSEMARY HAMILTON

IBM joins Federated to form retail outsourcing venture

BY NELL MARGOLIS
CW STAFF

WHITE PLAINS, N.Y. — IBM, its outsourcing subsidiary and Federated Department Stores, Inc. are poised to form a seven-year partnership that will aim specialty outsourcing services at the large-scale retail market.

Under the terms of a letter of intent signed last week, retailers in search of information systems aid or clout will be able to avail themselves of the combined force of IBM marketing, Integrated Systems Solutions Corp. (ISSC) hardware and a suite of software applications developed specifically for the retail industry and supplied by Federated's IS division, The Sabre Group. ISSC will serve as prime contractor on all combined deals.

The partners-to-be have already planted their respective outsourcing flags in retail territory. In addition to running all IS operations for the 220-store Federated chain, Sabre recently signed on to perform the same services for financially troubled R. H. Macy & Co. ISSC has outsourcing contracts with Zale Corp. — which, like Macy's, is currently in the throes of reorganization under Chapter 11 — Supermarkets General Corp. and Cullum Companies, Inc.

The contemplated IBM/Federated partnership will not extend to or affect any preexisting outsourcing contract of either partner's, said Glen Griffith, Sabre's chairman and chief executive officer.

Both Griffith and Sabre's house counsel expect a final agreement within 30 to 60 days.

If the deal goes through, it will be the second such vertical-industry partnership for ISSC this year. In March, IBM and ISSC pooled talents with IBM software partner Policy Management Systems Corp. to launch Inserv, a one-stop shop for insurance firms looking to outsource some or all of their IS functions.

Bull reveals host-Unix migration tool

BY ELISABETH HORWITT
CW STAFF

BILLERICA, Mass. — Integris, Groupe Bull's U.S.-based systems integration arm, last week took its shot at taking some of the pain out of migrating critical corporate applications from IBM mainframes to Unix systems.

Integris unveiled XPU4, software that allows a Unix system to act as an IBM host on a Systems Network Architecture network (SNA), enabling users to access applications on a Unix server via their existing IBM 3270 terminals, the vendor said.

"People typically have hundreds or thousands of 3270 terminals out there, which they don't want to throw away when they bring applications across to Unix," said David Matthews, an Integris vice president.

The package is also said to allow existing Unix or X Window System terminals to use the Transmission Control Protocol/Internet Protocol (TCP/IP) transport protocol to access IBM hosts across an SNA network. This enables users to support 3270 SNA and Unix TCP/IP local-area network traffic across the same corporate wide-area network backbone, Matthews said. The product is available now.

Integris also introduced XPU5, which is said to allow a 3270 terminal to address either an IBM mainframe or a Unix server anywhere on a multi-domain SNA network. The product is due out next month.

Pricing for both products starts at $800 for up to eight users.

Rising downsizing

Such products address a growing market of users who want to downsize some critical applications from the mainframe to a Unix-based client/server environment, said Michael Kennedy, a senior consultant at Arthur D. Little, Inc. in Cambridge, Mass. According to a recent study done by Arthur D. Little for a major power utility, it costs between 10% and 20% less to run and maintain an application on Unix than on a mainframe, Kennedy said.

However, it can cost tens of millions of dollars to completely re-engineer a major application "that is the lifeblood of a company," to run on a client/server environment, Kennedy said. "So a shortcut, like being able to use the same 3270 applications to access both Unix and mainframe environments, can be very helpful."

The Charles Schwab Corp., now in the midst of moving applications from mainframes to Unix systems, would very much like to use its "huge 3270 base" to access Unix servers, according to Cheri Anderson, a senior vice president in charge of technology at the San Francisco brokerage firm.

Schwab is looking for "scaffolding" products to ensure that users can access whichever system they need during the transition period, she added.

Integris also sells UniKix, a software product that is said to implement CICS on a variety of Unix systems. The firm also offers integration services for corporations downsizing applications from mainframes to Unix.

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IBM builds up server arsenal

BY MICHAEL FITZGERALD
CW STAFF

WHITE PLAINS, N.Y. — IBM last week doubled the power of its high-end local-area network server line with the release of three new Personal System/2 Model 95s that also offer mainframe-type security features. IBM also announced two new Model 90s and a number of processor upgrades.

In addition, IBM announced it would discontinue all 33-MHz 486-based Model 95s and 90s and cut prices on the discontinued models by 24%.

As explained by William E. Hoke, director of advanced systems for IBM's Entry Systems Division, IBM sees the need for a server with the power of a Compaq Computer Corp. SystemPro in its personal computer lineup. Hoke acknowledged that IBM is aiming for higher ground and has talked with superserver vendor Parallan Computer, Inc. about joining forces [CW, April 20], though he would not confirm a deal.

The new Model 95 XP 486 OMT is the first in a series of servers that will gradually gain more mainframe-type features. Among the various features built into the new Model 95s are security functions such as error-correcting memory, bus parity checking and synchronous channel checking.

Users contacted last week generally approved of this direction. "We can absolutely use the power," said J. Doc Hodges, information processing officer at Nationsbank in Charlotte, N.C.

Hodges said Nationsbank is using relatively few Model 95s but was beginning to evaluate superservers. He said the new Model 95s might fit in the low end of that category.

The flip side

One analyst disagreed with IBM's claims that the new Model 95 will outperform a SystemPro.

"They still aren't competing head-to-head," said Scott Stein, analyst at Technology Investment Strategies Corp. in Framingham, Mass. "The Model 95 can't run two processors, it doesn't have the secondary cache features, and it doesn't sound like the fault management is as good, either."

IBM said the Model 95 can run multiple processors using a special processor complex built by Aox Corp. It has also added cache, and the IBM machine runs a 50-MHz 486, where Compaq has a 25/50-MHz clock doubler at the top of its line.

"We'd like [a 95] with a little more power," said Joel Hadary, manager of financial planning systems at Hughes Aircraft Co. in Los Angeles. "We're running [IBM's] database manager on it, and it doesn't give us the performance we want, so we're looking for a more powerful Model 95 or a RISC processor."

Hadary welcomed the high-availability features that IBM has added to the Model 95 line but stated Hughes would have to test the machine before buying the product.

IBM said it doubled the Model 95's performance by enhancing the Micro Channel Architecture and by using a dual-bus design that can emulate 64-bit data processing to achieve data throughput rates of as much as 40M bit/sec. That is twice what today's best Model 95 can reach.

A coming 32-bit bus-mastering Token Ring adapter will enhance performance by as much as 3½ times, IBM said.

The Model 90/95 family has been almost the sole strong point for IBM's struggling PC division during the last year, according to both the company and analysts.

Despite what has been a generally lackluster market for such high-powered products, "these products will add to the continuation of the 90/95 family as a bright spot for IBM," Hoke said.

Powering up

IBM's new high-end servers were designed around Intel's DX microprocessor. Three of the five new systems are:

	Model 90 OL9	Model 95 XP 486 OLF	Model 95 X9 486 OMT
CPU	25/50 MHz 486DX2	25/50 MHz 486DX2	50 MHz 486DX
Main memory	8M bytes	8M bytes	16M bytes
Mass storage	160M-byte hard drive	400M-byte hard drive	1G-byte hard drive
Price	$7,895	$12,095	$22,645
Availability	Now	Now	July

CW Chart: Michael Siggins

New OSs shut down some clones

CONTINUED FROM PAGE 1

Windows 3.1's strengthened recovery abilities. Any data in memory at that time would be lost.

"Seems to me that the pattern of the parity errors is indicative of a software error," said Dean Beebe, a consultant at Advanced Paradigms, Inc. in Alexandria, Va. Beebe said he had tested his memory with a utility supplied specifically for his motherboard and had discovered no errors. Windows 3.1 says otherwise, however.

Another reason for Beebe's contention that a software error may be involved is that users on CompuServe, Inc.'s CompuServe are reporting errors only under certain software configurations while running certain applications. For example, removing some device drivers installed by Symantec Corp.'s Norton Desktop for Windows has "solved" the errors for users.

A Symantec spokeswoman said the company is investigating the problem, but she indicated that the firm also believes the culprit is silicon, not code.

However, "if you're generating a lot of errors under one software configuration and no errors under another, it makes a strong argument for a software problem," Beebe said.

A number of OS/2 2.0 users have also reported problems that are being blamed on memory. These users have had problems with memory expansion cards running memory rated for a different speed than the memory chips on their motherboards.

At least one clone system manufacturer, Datatech Enterprises Co., is recommending that users of their systems who experience problems running OS/2 try exchanging the low-quality memory sometimes installed by resellers for higher quality — and higher priced — memory modules.

A hard(ware) problem

Despite the user skepticism, Microsoft said it is sure the errors are hardware-based. "Diagnostic programs tend to only look at some areas of memory," said David Cole, group program manager for Windows 3.1. He added that parity errors were found to be the cause of some system crashes under Windows 3.0. To help eliminate the crashes, Microsoft upped the level of parity checking in the product when it released Windows 3.1.

Cole also said that while some users experienced no problems with Windows 3.0, they were running a risk of parity-related failure with the product. Users have "two choices: Go back to that risky environment or upgrade their memory," he said.

One of the frustrating aspects of the errors is tracking down exactly what is causing them, a process that can be time-consuming and fruitless.

Jim Archer, a computer systems engineer at GZA Geoenvironmental, Inc. in Newton, Mass., has tried everything from disabling memory banks to swapping memory and motherboards to try to get OS/2 2.0 installed on his machine. And while his system maker, Datatech, suggested trading his inexpensive memory chips for more name-brand memory, Archer said he is not happy with that as a solution. "I have a lot of money tied up" in memory, he said.

IBM acknowledged that some systems with "marginal memory" may not be up to the advanced requirements of OS/2 2.0. Marginal memory could be defined as memory from less mainstream manufacturers sold at lower prices. The price difference may come as a result of lower quality control standards on the chips.

But an IBM spokesman said the solution lies with the hardware vendors, not with OS/2.

Gateway to unveil low-cost notebooks

BY MICHAEL FITZGERALD
CW STAFF

NORTH SIOUX CITY, S.D. — A strong pricing wind will blow into the notebook market this week with the release of the Nomad series of notebook computers from mail-order clone maker Gateway 2000 Ltd.

Three high-powered, sub-6-pound notebooks comprise Gateway's first portable offering. Two 5.8-pound systems use low-power versions of Intel Corp.'s 25-MHz 486DX and 20-MHz 486SX, while a 5.9-pound system is built around an Advanced Micro Devices, Inc. 25-MHz AM386SXL. The systems are priced between $1,995 and $3,495, significantly lower than many similar systems on the market today [CW, April 13].

Users contacted expressed interest in the Gateway-designed, Texas Instruments, Inc.-built notebooks.

"It sounds like it might be worth looking into other alternatives to Compaq," said Chad Pearce, network administrator at the Philadelphia office of benefits consultancy Miller Mason & Dickenson. But Pearce added that while Gateway's pricing and features were impressive, he would have concerns about application compatibility. "We run some proprietary applications, and we've found in the past they don't always run on non-IBM, non-Compaq equipment."

Slumping support

Another user said Gateway's support problems [CW, April 6] would stop him from considering them seriously. "I had a really bad time with" their support, said Nagesh Rao, a microcomputer specialist at Diversey Corp. in Livonia, Mich. Rao said his company purchased four Gateway desktop systems and is unlikely to buy any more.

Gateway recently acknowledged that its technical support staff members are having trouble keeping up with service demands [CW, April 6]. The company said it is hiring additional personnel to remedy the situation.

Gateway initially said it would offer an expansion station as an option, then decided that the availability of optional networking adapters would suffice.

Make way for Gateway

The direct-mail vendor's entry into the notebook market includes:

	Nomad 386SXL	Nomad 420SXL	Nomad 486DXL
CPU	386SX 25 MHz	486SX 20 MHz	486DX 25 MHz
Main memory	2M bytes expandable to 6M bytes	4M bytes expandable to 20M bytes	4M bytes expandable to 20M bytes
Mass storage	80M-byte hard drive	80M-byte hard drive	120M-byte hard drive
Key features	—	Windows 3.1 pointing device	Windows 3.1 pointing device
Price	$1,995	$2,795	$3,495
Availability	May 11	May 11	May 11

Source: Gateway 2000 Ltd.

CW Chart: Michael Siggins

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CLIENT/SERVER ARCHITECTURE FOR THE ON-LINE ENTERPRISE

Users like DEC plans but wait for products

BY THOMAS HOFFMAN
CW STAFF

BOSTON — Users are decidedly upbeat about Digital Equipment Corp.'s plans to integrate Microsoft Corp.'s Windows New Technology (NT) operating environment with DEC's upcoming Alpha-based systems. However, in the absence of product, they remain unsure about when they will move to the next-generation platform.

DEC's challenge at its three-week-long DECworld '92 conference — which kicked off last week and is expected to draw between 25,000 and 30,000 attendees — is to convince enough VAX/VMS users that the Alpha/Windows NT combination is worth migrating to. DEC is making the high-powered pitch as it quietly concedes the inevitable: Slowing sales growth is necessitating drastic cost cutting (see story at right).

"We have to see just how robust NT is before we commit to it," said Duane H. Davis, manager of mathematical and statistical analysis at Corning Glass Works in Corning, N.Y.

Other users were excited about the DEC/Microsoft alliance. "We think the Microsoft NT/DEC Alpha alliance makes a lot of sense," said Greg Findley, manager of decision support systems at Heinz Pet Products Co. in Newport, Ky. Findley said that while Heinz currently uses Windows, "it's hard to say whether we'll move to NT until we see the product."

Davis said he has high hopes for the next-generation Windows operating system. "My feeling is that NT is going to win [against IBM's OS/2]. By 1995, it could be the next Unix."

Wait-and-see attitude

Other customers said they are more concerned with Alpha migration. Barclays Bank PLC in San Francisco, a large VAX shop, will wait until it is sure that Alpha's customized All-In-1 applications can run without a hitch on the new platform. "Alpha would have to offer us a comparable All-In-1 environment for us to even consider migrating," said Scott Smith, systems analyst at Barclays' Management Services Division.

With heavy investments in VAX/VMS hardware, operating systems and related applications, users agreed the move to Alpha would have to be cost-justified.

DEC's VAX-to-Alpha migration plans include applications porting and conversion assistance services and VAX/Alpha purchasing incentives.

Under the Digital Investment Protection Strategy unveiled last month, customers ordering VAX systems now can upgrade to Alpha systems from April 1993 through June 1994 with trade-in incentives for any VAXs ordered before June 1992.

For software upgrades, Alpha-capacity licenses will be upgraded for 33% of the VAX software license's list price. Personal and concurrent user licenses will be exchanged on a 1-for-1 basis at no cost.

DEC's incentive plans appeal to some users. For example, The Quaker Oats Co. in Chicago will spend the next year or so upgrading its manufacturing systems — overburdened VAX 8300s — at its 17 core U.S. manufacturing facilities. According to Therese M. Jennings, information services account manager at Quaker Oats, early discussions about incentive plans for VAX-to-Alpha migration sound promising.

"If they can get us [to Alpha] on VAX 4000 and VAX 6000 Alpha equivalents at the performance levels we've been hearing, then we'll be very excited about this," Jennings said.

Analysts said they expect the first Alpha systems to be workstations running on the 200-MHz reduced instruction set computing-based Alpha chip, which is twice as fast as any RISC chip currently available.

Layoffs loom

DEC steadfastly refused to confirm reports that it will lay off 10,000 to 15,000 employees during fiscal 1993, which begins July 1.

The layoff reports accelerated after the company reported an operating loss of $294.1 million for its fiscal third quarter ended March 28, the company's second consecutive quarter of deep red ink.

Company officials acknowledged that DEC expects to cut roughly 4,000 jobs in the fiscal fourth quarter, ending June 30, to reach the previously announced goal of work force cuts of 10,000 positions by the end of fiscal 1992.

Speaking at DECworld '92, DEC President Kenneth H. Olsen dodged the layoff question. "I clearly see that cutting our sales force in half doesn't solve the problem," he said. "We won't make wholesale cuts just because some consultant says we should."

Olsen did say that it should not take the company 18 months to regain profitability, as some analysts have projected. "I sure hope it doesn't take 18 months," he said. "I can argue that we're a victim [of the recession], but companies that make cuts suggested by [the] press and analysts to meet economic conditions don't last very long."

More executive changes are also under way at DEC. Company insiders last week said that William Strecker, one of three prominent executives sidelined in the latest restructuring, has been named vice president and chief technical officer and is now a member of the executive committee.

THOMAS HOFFMAN

Unkind cuts

As DEC's growth has slowed, its head count has gradually declined

CW Chart: Janell Genovese

Chemical cashes in on consolidation

CONTINUED FROM PAGE 1

Measures to accomplish this include the following:

- Merge eight existing IBM mainframe data centers into two centers, to be located in Somerset, N.J., and Wilmington, Del.
- Combine four midrange system data centers, which house Digital Equipment Corp. VAXs, IBM Application System/400s and Tandem Computers, Inc. hosts, into two sites: one in Manhattan and one in Wilmington.
- Merge the applications and databases serving similar business lines. Chemical hopes to provide users with a seamless view of applications as well as implement a consistent federal reporting system by year's end.
- Consolidate network facilities corporatewide. This is expected to account for $24 million out of the total $66 million annual savings expected from IS consolidation.

The above efforts have received a big boost from IS consolidation efforts under way at both banks prior to the merger, Mayer said. Data center consolidation saved Chemical between $22 million and $26 million annually from 1987 to 1991. And Manny Hanny had already eliminated three of its seven large systems data centers.

Mayer's team has also been able to base its current network management projects on prior work, according to Chemical Senior Vice President Joseph Pocchia. Chemical has been working with IBM for about six years in an effort to move toward "one environment to manage change, problems, systems, applications and configuration" based on SystemView and NetView, he added (see story at left).

Chemical chose IBM because the vendor's systems and network management strategy seemed most likely — in the long run, at least — to manage the mixed bag of incompatible equipment that Chemical keeps adding via its acquisition strategy, Mayer said. Since 1987, Chemical has acquired three major banks, including Manny Hanny.

One user, many systems

The company has already put in place a basic, SystemView-based platform for managing its mainframe data centers, Mayer said. The system promises to conserve manpower by enabling one user to manage many systems from a single console and graphical user interface and by automating management tasks wherever possible.

Chemical is already realizing about 80% of the benefit it expects to get from automating mainframe operations, Mayer said.

Last month, Chemical completed work on a platform for managing DEC, IBM and Tandem systems at its midrange data centers, according to Chemical Senior Vice President Tom Vicknair.

Building on prior work by Manny Hanny, the platform uses DEC's Polycenter and DECmcc Director to consolidate management of some 30 computers onto one console. Vicknair's group is now implementing software to automate backup and scheduling functions on all the midrange systems.

By next month, Chemical expects to provide NetView-based management of key telecommunications systems, such as Network Equipment Technologies, Inc. switches, Vicknair said. Eventually, the bank plans to consolidate management of all devices — 80 different types at present — under NetView.

And by next October, Vicknair said, he expects to have put in a link that allows Polycenter to send alerts to the central IBM SystemView control center. The idea is to provide SystemView users with an overall view of the corporate network — including proprietary midrange networks such as DECnet.

Chemistry in alliance

Last spring, Chemical Banking formalized what it describes as a partnership with IBM in which the bank has acted as a test bed for some key IBM products — and in return, has gotten some needed features ahead of the general market.

That relationship has taken on some added weight since Chemical staked its integrated network management strategy on IBM's still-vaporish SystemView platform. "We keep installing products that become functional and hope that IBM keeps ahead of our needs," said James Mayer, a Chemical senior vice president of information and technology management.

When IBM falls a little behind, its technicians sometimes come in to fill the gap. The two companies are working to integrate management of some 18 devices under IBM's NetView, Chemical Senior Vice President Joseph Pocchia said. While NetView can collect alerts from many of those devices, Chemical also wants to be able to issue commands to those devices via the network management platform, Pocchia said.

IBM has also made several key products available to Chemical ahead of time. For example, the bank is now evaluating NetView Version 2.3, which still has no formal release date. Chemical is also evaluating IBM's unshipped NetView/6000, an AIX RISC System/6000-based platform, as a way of managing its non-IBM local-area network systems, Pocchia said.

ELISABETH HORWITT

Unisys and users meet to discuss migration, product development

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — With no immediate worries about their vendor's financial viability, two Unisys Corp. user groups met here last week and expressed concerns mostly over product evolution, migration from older architectures and connectivity to Unix systems, Digital Equipment Corp. computers and IBM mainframes.

The task of migrating to new systems was the subject of several user sessions at the Cube and Use, Inc. conference, which combines the old Sperry Corp. and Burroughs Corp. groups. Some users have had their older Sperry and Burroughs systems in place for 10 to 15 years. Others have bought the newer A series and Unisys 2200 mainframes but continue to run old Cobol applications.

"Unisys is upgrading a lot of their customers to prevent the erosion of the installed base," explained Terry Moser, manager of systems integration for the Public School Employees' Retirement System, a Harrisburg, Pa., pension fund. But the V series and the OS/3 system for Sperry System 80s will be phased out, probably by 1999, Unisys said.

Users from both Use and Cube are experimenting with Unix, buying Unix packages for departmental workstations that cost far less to operate than mainframes. Others view Unix and open systems networks, such as Transmission Control Protocol/Internet Protocol, as integration tools for multivendor shops. "People are moving to open systems as a way to integrate Unisys systems with others from IBM and DEC," said Use President Thomas R. Murphy, director of technical support at the Naval Computer and Telecommunications Station in Newport, R.I.

"Unisys marketed themselves right out of our site," said John Dobnick, a systems programmer at the University of Wisconsin at Milwaukee and a Use member for 16 years. "It was the high software charges for our old machine that killed it." The school, which turned off its aging Sperry 1180 last year, uses a Convex Computer Corp. C220 minisupercomputer running a network of DECstation 5000 desktop Unix machines.

Users complimented Unisys Chief Executive Officer James Unruh on cutting overhead costs enough to generate profits even without growing Unisys' $8.7 billion business — which is down from 1990's $10.1 billion in revenue. Unisys recently reported a first-quarter profit of $48 million, following a profitable fourth quarter of 1991.

"They've leaned up, they've cut a lot of costs, and they've still got a strategic direction," said Jim Shelton, director of data processing at Global Petroleum Corp., a Waltham, Mass., fuel oil distributor that uses a Unisys A6 mainframe.

But Scot Cerka, manager of technical services at aircraft parts maker AAR Corp., an A series shop in Elk Grove Village, Ill., was somewhat skeptical. "I'll be more confident when they've had three or four profitable quarters," he said.

LANs get 'light' management chip

BY JOANIE M. WEXLER
CW STAFF

Building blocks for allowing users to better balance price/feature trade-offs in local-area network management decisions spilled out of National Semiconductor, Inc. last week with the firm's unveiling of a "light management" chip for departmental wiring hubs.

Products based on the chip are shipping from several vendors and reportedly lower per-port hub costs by 25% to 50%.

National Semiconductor said its Lite-End Repeater Interface Controller (LERIC) chip will provide users of LERIC-based wiring hubs with a finer granularity of management choices for small LANs. Users of 10Base-T hubs based on LERIC will reportedly gain a middle choice between no management and a surplus of management features for which they would prefer not to pay.

Intellicom, Inc. in Chatsworth, Calif., for example, is now offering personal computer-based, six-port hub cards for $325 (about $54 per port), as well as a $375 stand-alone 10Base-T hub ($62.50 per port). The products include the mandatory hub-level diagnostics specified by the draft IEEE 802.3 hub management standard but omit the standard's port-level options.

Intellicom's per-port prices compare, for example, with Cabletron Systems, Inc.'s lowest end manageable 10Base-T hub, the MRXI, which is $183 per port but offers the additional functionality. David Cullerot, Cabletron's Ethernet product manager, said the company will base new models of that hub on LERIC, which integrates several circuitry components and thus lowers manufacturing costs.

Cabletron also said it will announce this week a 24-port version of its MRXI that is not LERIC-based. It will list for $3,995, or $166 per port.

NEWS SHORTS

U.S. adds to pirate list

The U.S. government last week added Taiwan to its list of top software pirates and boosted South Korea to its "priority watch list" of offenders. The Business Software Alliance (BSA) estimated that in 1991, U.S. vendors lost $290 million to software piracy in Taiwan and $123 million in South Korea. The U.S. has six months to decide if it will take retaliatory trade action against Taiwan. The BSA praised draft copyright law revisions in Germany for keeping that country off the priority list.

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Sniffer targets end users

Network General Corp. has begun shipping its Expert Sniffer, a version of its local-area network monitoring system said to guide nontechnical users through the complexities of protocol analysis. The product includes the ability to analyze most popular network protocols. The same analytical ability now comes bundled with regular Sniffer for $12,500 and with Expert Sniffer for $15,500. Previously, it cost $17,500 to purchase regular Sniffer with the full protocol suite.

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Microsoft certifies consultants

Microsoft Corp. has announced a certification requirement for independent consultants working under the Microsoft Consultant Relations Program. Candidates must pass a set of examinations designed to measure expertise in areas such as Windows, MS-DOS and Excel. Those who pass the exams can then be assigned either to associate or partner classification. Associates will be labled "generalists," while partners will be classified as "experts."

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Flat-panel project gets funds

A joint venture between Microelectronics and Computer Technology Corp. and Kopin Corp., a Taunton, Mass., maker of electronic digital imaging devices, will receive $2.8 million for a three-year project to build active-matrix flat-panel displays for use in products such as notebook computers. The award comes from the U.S. Department of Justice's Advanced Technology Program.

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Short takes

IBM last week announced a 25% to 40% price decrease in its Power Visualization System server, an 8- to 32-way parallel processor now reduced in price from $529,000 to $320,000. Later this year, IBM plans to extend its $5,900 Visualization Data Explorer software package beyond the RISC System/6000 to other Unix platforms from Sun Microsystems, Inc., Hewlett-Packard Co. and Silicon Graphics, Inc. . . . The newly formed, nonprofit **National Information Technology Center** in Rockville, Md., appointed Michael J. Walter president and chief executive officer. The center is intended to act as a technology brokerage to develop new information technology applications. Among its early focus will be imaging, network management and Integrated Services Digital Network. . . . **Information Systems America, Inc., NEC Corp.** and **Hyundai Electronics, Inc.** were among eight vendors who said they will use Phoenix Technologies Ltd.'s PenBIOS system software for their pen systems. . . . **MCI Communications Corp.** signed a $35 million, multiyear contract to build a satellite-based network for **Holiday Inn Worldwide**. . . . **Wellfleet Communications, Inc.** signed a worldwide reseller deal that allows **Prime Computer, Inc.**'s business unit, PrimeService, to market Wellfleet products worldwide. . . . Philip W. Huelson has been promoted to president and chief operating officer of **SPARC International, Inc.** . . . **AST Research, Inc.** shipped its Premium SE 4/50 server, based on Intel Corp.'s 50-MHz I486DX; it set pricing at 10% less than previously announced, unveiling a base price of $8,895. AST also cut pricing 10% on its 33-MHz SE 4/33 server. . . . **Unisys Corp.** and **Systems & Computer Technology Corp.** will jointly market products to colleges and universities nationwide and to local governments. . . . **HP** now offers two support services to help customers in North America implement and manage networked system environments more efficiently, including a site design and implementation program and another that targets support and cost issues.

Sun cuts workstation prices up to 26%

BY MARYFRAN JOHNSON
CW STAFF

MOUNTAIN VIEW, Calif. — Two weeks away from its planned May 19 rollout of a completely refreshed line of workstations and servers, Sun Microsystems, Inc. last week unveiled a $5,995 color workstation and dropped its desktop prices by as much as 26%.

Sun's slippage in leading-edge performance — while IBM, Hewlett-Packard Co. and Digital Equipment Corp. all gained ground — adds urgency to the upcoming rollout. "Sun has been in a bad spot, and they need to get something to market," said Darren Curtis, a Unix system administrator at Battelle, Pacific Northwest Laboratory in Richland, Wash., which has a network of 200 Sun workstations.

"We've been waiting for these price cuts," Curtis said. He said the laboratory also may buy another dozen SPARCstation 2s and a half dozen IPX machines.

"I am very confident Sun will close the performance gap," said Jeffry Canin, an analyst at Montgomery Securities in San Francisco. He and other analysts said Sun's new line will more than double current performance ratings with reduced instruction set computing systems built around the long-awaited Viking SuperSPARC chip from Texas Instruments, Inc., which at the high end is expected to have 70-plus SPECmarks of performance.

Sources familiar with the next-generation SPARCstation 3 said Sun rebuilt the inside of the system, adding a fourth Sbus slot and leaving room for two CPUs. Internal memory is expandable to 512M bytes, and the system is fully enabled for multimedia applications.

The combination of price cuts on current models and "a hefty ramp-up" in volume shipments of the new machines by September should stimulate enough demand to keep Sun's sales volume up through this transition period, said Robert Herwick, an analyst at Hambrecht & Quist, Inc.

The $5,995 color workstation is a repackaged version of the Sun IPC with a new 16-in. Sony Corp. monitor. Like the original $6,995 IPC, this model includes a 207M-byte internal disk drive and 8M bytes of random-access memory. Sun compared its entry-level color model to a similarly configured IBM RISC System/6000 Model 220 priced at $9,995 and an HP/Apollo 9000 Model 710 priced at $14,000.

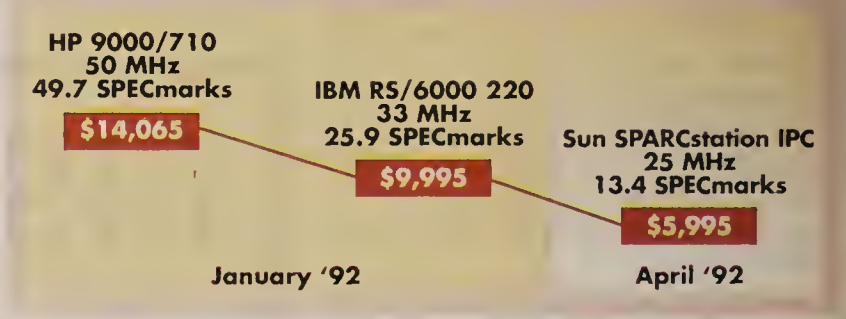
"That's a terrific value for a completely empowered color workstation," said Michael Prince, MIS director at Burlington Coat Factory in Lebanon, N.H., one of Sun's largest customers. "It gets my juices stirring just thinking about the kinds of applications we can consider now that we never would [have] on a $10,000 workstation."

Despite the marketing advantage Sun's competitors have enjoyed in the past year with their higher performance machines, Prince said he is "very comfortable" with Sun's long-term plans for the Viking chip and other Scalable Processor Architecture (SPARC) chips. "Sun will be there on the high end when I need them to be," he added.

Other price decreases took the SPARCstation ELC monochrome system down $1,000 to $3,995, and the 16-in. and 19-in. color models of the SPARCstation IPX down $3,500 to $9,995 and $10,995, respectively. The SPARCstation 2 was also cut back $3,200 to new prices of $15,295 and $16,295 for the 16-in. and 19-in. color models.

Color me cheap

Sun's SPARCstation IPC is the first color workstation to breach the $6,000 price barrier



CW Chart: Michael Siggins

Big Blue has big plans for RISC System/6000

CONTINUED FROM PAGE 1

Ron Barsena, an engineering vice president at Air Products and Chemicals, Inc. in Allentown, Pa. His site has a mixed environment of Unix workstations, personal computers and an IBM mainframe.

Alberto Finol, assistant general manager for Venezuelan oil company Maravan SA in Lagunillas, expressed a similar sentiment. "We want to see what advantages we can gain for our two main areas: seismic processing and reservoir simulation," said Finol, whose firm is planning to add 12 RS/6000s to the two now used at its Caracas headquarters.

IBM plans to sell clustered RS/6000s for batch or parallel processing applications, with the average configuration including about 15 machines and costing close to $1 million, Hester said. In IBM's vision of its Unix future, RS/6000 clusters will offload production applications from mainframes that increasingly function as huge database repositories and file servers.

The expanding line of "general-purpose" supercomputers will travel a forked path, with System/390 vector mainframes available now and RS/6000-based highly parallel clustered systems reaching the market next year and in 1994. Today, IBM counts 550 installed supercomputer/vector mainframes worldwide, said Irving Wladawsky-Berger, assistant general manager of supercomputing systems at IBM.

IBM executives also told users to watch for the following:

- RS/6000 clusters moving to high-speed interconnect technology within two years via the 1G bit/sec. Fiber Channel Standard, which IBM is already prototyping. Once ready for market, it will outperform the 100M bit/sec. Fiber Distributed Data Interface communications pathway.
- An initial boost in the RS/6000's mediocre graphics capabilities when GT4 and GT4X adapter cards start shipping this summer. Coming next: much greater performance through tighter hardware integration between the CPU and the graphics subsystem.
- General availability this summer of the High Availability/6000 software, a set of systems software services providing close to crash-proof environments. A handful of customers in financial, telecommunications and emergency dispatch businesses are now using HA/6000 software on special order.

IBM has no intention of creating fault-tolerant RS/6000 systems, however, and will continue reselling Stratus Computer, Inc. machines as the IBM System/88s. "There will always be a market for fault tolerance, but that will shrink as Unix high availability gets ready for prime time," Hester said, referring to commercial site use rather than scientific or technical.

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Early adopters give approval

CONTINUED FROM PAGE 1

their favor.

"Loss of control" ranks high on lists of reasons to resist outsourcing. If that is your worry, do not cede control, advised Jack Livingston, chief information officer at Minneapolis-based National Car Rental. In early 1991, National signed a 10-year contract worth an estimated $500 million that gave applications development to Electronic Data Systems Corp.

To ensure the final say over National's strategy, Livingston retained a corps of 10 senior IS managers and built a contractual "qualifications floor" under the work force who transferred to EDS.

"Control, of course, means different things to different IS departments," said Ulf Andersen, director of IS at Hartford, Conn.-based United Technologies Corp., which outsourced three of its business units last year but retained control of its applications development and network.

Howdy, partner

It is also important to look for an outsourcer with whom you can live. Hibernia, an $800 million bank-holding company based in New Orleans, chose IBM's Integrated Systems Solutions Corp. because it was best positioned to let Hibernia keep three valued attributes intact: its IBA/Hogan software platform, its corporate culture and its staff. ISSC hired 100% of the bank's IS staffers and so far, Executive Vice President Kirk Domingos said, none have left.

Remaining flexible is a critical issue for IS executives who fear being locked into a potentially expensive mainframe environment just when smaller, cheaper platforms are becoming more viable. Some users hedge their bets by curtailing the time frames of their deals.

Ultramar, Inc., a $1.8 billion independent oil refiner and marketer, farmed out its IBM mainframe processing to Dallas-based Power Computing Corp. but kept the contract to three years. Power Computing is guaranteed a monthly minimum of processing business, which corresponds to roughly 25% of Ultramar's current needs.

Several IS executives warned that it is smart to plan for the possibility of getting out.

One IS executive at a Fortune 1,000 industrial firm who asked not to be identified said his experience has been "a total horror show." The company is trying to extricate itself from a long-term outsourcing contract and has spent "multiple, multiple millions on aborted efforts to bring IS back in-house," he said.

What went so wrong? "Just name all the problems you have on in-house development," he said, citing missed deadlines, crossed wires, mounting backlogs and hidden costs, to name a few. "And that's what you get with an outsourced effort — except everyone expects to be paid cash on the barrelhead at the going rate at every turn." Unlike in-house staff, however, "you can't fire them — not if your whole system is totally outsourced," he said.

Beware the outsourcer

The executive had one word for IS shops considering outsourcing: "Don't." Asked why so many of his peers appear to feel otherwise, he acknowledged being baffled. "I don't understand why IS departments are flocking to do this," he said, "unless some firms are so disgruntled that anything but their own IS efforts looks good to them."

Nevertheless, the triple temptations of slashed costs, leveraged technology development and the chance to focus tightly on core business concerns leave many more firms bargaining to get into outsourcing deals than begging to get out.

In fact, some nearing the end of short-term contracts are looking to re-up. Ultramar, for instance, plans to renew its contract with Power Computing when the contract lapses in October. And the second time around, flexibility — particularly regarding technology — will once again be a key concern, Ultramar's IS director Herb Chaplin said.

Still, the reigning fears that haunt users — loss of control and the possibility that technological and economic changes will leave users shackled to outdated contracts — refuse to fade. The search for safeguards is spotlighting the outsourcing contract as perhaps the user's most effective safeguard (see story below).

And efforts to import user-protective flexibility into the outsourcing structure are giving rise to variations on the 10-year, facilities management-style "megadeal."

Outsourcing vendors, including Chicago-based Andersen Consulting and Ottawa-based SHL Systemhouse, Inc., are betting their near futures on two- to six-year deals that are closely linked to specific, finite user goals.

A quick fix

In addition to addressing the users' most prominent fears by trimming the duration and scope of the deals, the vendors' move is based on the assumption that — particularly as an increasing number of firms step up transitions to client/server architectures — more will need a quick hit of specialty outsourcing (also called 'transitional outsourcing') than will want to farm out their entire IS shops.

Is this really what users want? Chaplin said it is. He cited, for example, Revlon, Inc.'s recent signing of Andersen Consulting to run its mainframe-based IS operations while the cosmetics giant makes the transition to client/server.

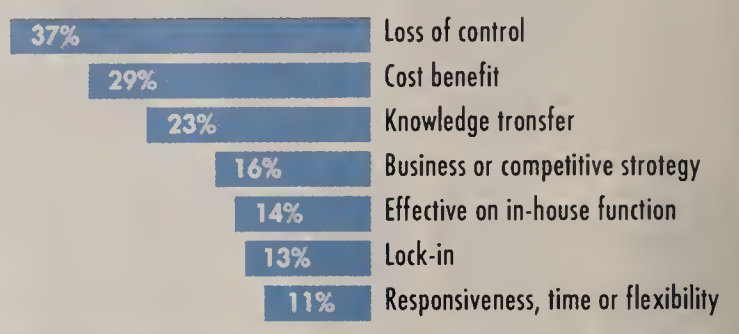
"I think I'm safe in saying there isn't a member of the [group of 100 large commercial firms we closely monitor] that hasn't done an outsourcing evaluation at least twice," said Howard Anderson, president of The Yankee Group, a market research firm based in Boston.

In 1989, Anderson said, 66% of the "Yankee 100" executives said they were opposed to outsourcing; in 1991, the number dropped to 34% — largely, he said, because of the newly flexible outsourcing alternatives and the prospect of more to come.

"Nobody wants to lose control of their strategic IS functions," Anderson noted, "but on the other hand, the idea that you have to hold on to it all is passe."

DO WE OR DON'T WE?

What are the principal reasons why you would argue against using a third party for an important business function?



Aside from cost-containment, what benefits must be presented for your organization to consider using a third party for an important business function?

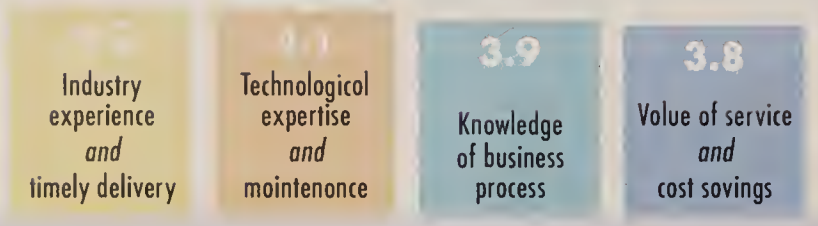
Percent of respondents; Multiple responses allowed (Base: 107)

Source: The Yankee Group — CW Chart: Marie Haines

HOW ARE VENDORS DOING?

Customers are more satisified with their outsourcers' product delivery timetable than with their prices

1 = Not at all satisified 5 = Extremely satisified



(Survey of 500 respondents)

Source: Dataquest/Ledgeway — CW Chart: Marie Haines

Experts dish out provisions for a solid outsourcing contract

In outsourcing, the contract is key — and key to a solid contract are fair goals and detailed terms, experts agree.

Noted Yankee Group analyst Susan McGarry: "If your vendor is out of business, it doesn't matter what a great price you got." However, the need to let the vendor make a profit does not conflict with the right to drive a hard bargain.

H. J. Heinz Corp. outsourced its mainframe operations to Genix Corp. in 1989. Three years into the decade-long deal, Heinz said it is happy with its service level and savings. Phil Lichtenfels, senior executive consultant, said he credits the contract.

Highly detailed and "half-an-inch thick," it spells out guaranteed service levels and provides penalties for nonperformance. "It's important to establish what the criteria are before you start and to continue to monitor that," Lichtenfels said. "Make sure you have appropriate service targets, response time and system availability."

Robert Zahler, a partner at Pittman, Potts & Trowbridge — a Washington, D.C.-based law firm that has represented users in several high-profile outsourcing megadeals — offers these additional contract term possibilities:

- **A technology refreshment clause.** This guards against the user's being locked into obsolete technology by obligating the vendor to keep the user technologically competitive in its niche.
- **Personnel provisions.** When 200 National Car Rental information systems employees went to work for EDS under the firms' outsourcing contract (see story page 1), National's CIO, Jack Livingston, bargained for the contract to attach a minimum expertise guarantee to each job. "If EDS loses one of my very experienced people," he said, "they will have to put two or more people on that job until they find a replacement" with at least the expertise level of the departed employee. The agreement provides a significant degree of ongoing control over IS work force quality.
- **An exit provision.** Spell out in as much detail as possible the circumstances under which each party can end the relationship and who will owe what to whom under each circumstance.

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Stratacom IPX lets users view traffic patterns

BY JOANIE M. WEXLER
CW STAFF

SAN JOSE, Calif. — Stratacom, Inc. took strides last week to quell user uneasiness about trusting their data to public networks.

The firm, whose IPX switch is the platform for several public frame-relay services, enhanced the product's StrataView Plus management system with the ability to generate detailed, graphical reports on network traffic.

While applicable to users of IPX gear in both private and public networks, the move is more likely to grab the attention of users considering IPX-based public services. This is because a new access interface to StrataView Plus' relational database will eventually let carriers' customers peek into their slice of a frame-relay network and examine their traffic patterns from several perspectives.

The ability for users to electronically track their data once it hits the public network is rudimentary today, and "most users are flying blind with data services," said Brian Button, director of product marketing at Stratacom.

Analyzing traffic patterns on-line helps users in network design and capacity planning, which for the Pacific Stock Exchange "is a critical function, as evidenced by the 600-million-share day the securities industry had in October 1987," said David Eisenlohr, vice president of telecommunications at the exchange. He said the exchange, an IPX shop, intends to move soon to a hybrid private/public network strategy.

To date, "no one has really been able to figure out what happens to the frames once they enter the public domain," said Doug Gold, director of communications research at International Data Corp. in Framingham, Mass.

However, management is just one component of user discomfort with emerging public data services, said Frank J. Rezac, project manager at the Office of Telecommunications Control for the city of New York. Other glaring issues, he said, are connectivity reach and consistent end-to-end services among telephone companies as they decide which new technologies to emphasize.

Right step

Rezac said, though, that enhanced management is a step in the right direction because in the public network, "you have nowhere near the management capability you do with a private backbone."

CompuServe, Inc., BT North America, Inc. and WilTel have all confirmed that they plan to offer Stratacom's management enhancements with their IPX-based frame-relay services. CompuServe's director of marketing, Andy May, said the capability will be important if the carrier decides to offer usage-based pricing to customers requiring frame relay for occasional applications.

However, WilTel's marketing product manager for broadband services, Chris Heckart, said that the development work required by carriers to customize the system is significant. She said WilTel hopes to make the management function available by the end of the year.

Gone public

Much-needed management enhancements to Stratacom's IPX will bring users of public data services based on the switch management capabilities more in line with those of their private networks.

- **The vehicle:** An Informix Corp.-based SQL relational database coupled with Informix's Wingz spreadsheet report-generation package.
- **The benefits:** Users can generate reports over any specified period of time on frames, bytes or cells transmitted or received; peak and total usage; errors; throughput; and congestion. This allows them to determine early on if they have over- or undersubscribed frame-relay bandwidth.
- **The price:** $10,000 to $20,000, depending on network size, for private network users and carriers; $8,000 upgrade cost for existing users with eight nodes or more. Management service prices from carriers to be determined.
- **Availability:** Available to IPX customers in June. Availability to carrier customers expected to start late this year.

Check out the Marketplace Pages on Page 100.

ADVANCED TECHNOLOGY

TECH TALK

Pest control

■ Can you think of a worse place for software bugs than in aircraft guidance systems? Probably not. As systems become more complex, one tiny bug can seem pretty big. With that in mind, the U.S. Army is working to improve fault-testing software designed to catch such bugs in aircraft guidance systems. One researcher working on the project, Derek Morris, an associate professor of electrical engineering and computer science at Stevens Institute of Technology in Hoboken, N.J., said that as processes become more automated, it is more likely that the wrong mode can be implemented when the system faces an unanticipated set of circumstances. Morris is working under contract with the Electronics Technology and Devices Laboratory at the U.S. Army Laboratory Command at Ft. Monmouth, N.J.

In the cards

■ Facilities managers and security personnel are always challenged by having to maintain that delicate balance between keeping unwanted visitors out of sensitive areas like laboratories and computer rooms and minimizing the aggravation for those who legitimately belong there. The way to manage such access is likely to be identification cards, although technology is making those cards smarter, according to recent research. A report by Frost & Sullivan International in New York said there is a general trend toward more advanced types of smart cards, with many of those cards being paired up with other technologies such as retina scans and other biometrics and radio-based proximity systems. The study said the U.S. electronic access control equipment market is expected to grow from $322 million in 1991 to $420 million in 1995, with card technologies making up more than two-thirds of those totals.

Equipping rental cars for the future

Leading-edge technology has its place, but rental agencies remain cautious

BY CHRISTOPHER LINDQUIST
CW STAFF

Car rental agencies have something of a reputation for being rather conservative with whiz-bang technologies — and with reason. Surveys conducted by some agencies show quite clearly that the most important thing to a customer is: "Get me into and out of my car as quickly and with as little hassle as possible."

As a result, while many agencies have research and development departments investigating futuristic technologies, the biggest high-technology advantages these companies have found are not so flashy. Where the companies are looking at far-out technologies, they are considering applications such as outfitting cars to use the "smart highways" that can give drivers access to traffic information, maps and emergency assistance and installing in-car, hands-free cellular phones that produce itemized bills right on the final rental bill.

"We all offer basically the same product," said Gary Orrell, staff vice president for MIS at The Hertz Corp. As a result, "if you [the customer] can get your job processed faster, you'll go that route."

More self-service

Hertz has concentrated on such automated procedures as self-service car returns. Renters simply drop off their car and proceed to an automated teller machine-like computer where they are prompted through the return and given a receipt.

Such proven technology works, according to the rental companies.

National Car Rental Systems, Inc. has offered similar service through its Emerald Club for the past two years. A renter simply gets off the plane, picks a car, drives to the exit booth, has an Emerald card run through a card reader, and "they're off," said Michael J. Olsen, vice president of corporate communications. National also has a "Smartkey" machine that completes a car rental without any human interaction. The renter goes to a machine, inserts a credit card, selects a car and is given the keys. The car can also be returned via the Smartkey machine.

Another customer convenience used by National — introduced by Alamo Rent A Car, Inc. seven years ago — is the airline ticket-size rental agreement. In addition to being easier for customers to handle, it "saves us money, and there's no reason to have trash and paper floating around," said Thomas Loane, vice president of computer and communications services at Alamo.

Mark Fisher

Leading-edge technology has a limited place in car renting, according to Loane. "It is very important for us that the customer see a real benefit," he said. "We don't do things just for fun. We want to make a real difference."

It is not surprising, then, that Loane said he believes the biggest technological advance for car renters was the advent of the handheld radio terminals that are used to speed car returns at many rental companies. That technology has been in use since the late 1980s.

This is not to say that rental agencies are not beginning to use some more advanced technology for tasks other than helping customers avoid a rental line. National has installed and is testing what it calls the Vehicle Information Service (VIS), a nationwide database of every car in the National fleet that helps the company track rental patterns and inventories. "The car rental industry is notorious for losing cars," Olsen said. National hopes VIS will eliminate that problem in its 125,000-car fleet.

Listening to complaints

In addition, VIS can be used to analyze customer satisfaction. Managers can call up VIS information at any time to check for patterns, such as a series of complaints about a certain car type or particular agency. To outsiders, the system remains something of a mystery because National has not formally announced it.

National is also working with Electronic Data Systems Corp. to install cellular phones in its cars. Previously, cellular phones in rental cars required the renter to use a calling card to place calls, meaning that the bill for the call could arrive weeks after the trip. To solve the problem, National gives renters a personal identification number that they key into the phone before each call. A detailed call list and bill are then presented to the customer with the car rental bill.

For its part, Avis, Inc. is experimenting in the Orlando, Fla., area with "smart cars" that take advantage of the smart highways available in that area. Drivers unfamiliar with the region who want to get to Disney World, for example, could simply input their destination and have the computer give them a map, audio and visual driving instructions and traffic information for the route.

Smart streets

While Avis is testing rental cars on "smart highways" in the Orlando, Fla., area, AT&T and Lockheed have set their sights on making roads intelligent worldwide.

The companies have agreed to investigate opportunities as a result of the Intermodal Surface Transportation Efficiency Act of 1991, which aims to improve roadway capacity, safety, efficiency and air quality through technological means that are known collectively as Intelligent Vehicle Highway Systems.

The companies have said they intend to use "smart cards" and other technologies to create roads capable of such functions as detecting breakdowns, rerouting traffic and summoning assistance. Intelligent roads could also increase the efficiency of freight shipments by eliminating the need for weigh stations. Smart roads could electronically determine information about the vehicles, such as weight and fuel taxes, while the trucks keep moving.

CHRISTOPHER LINDQUIST

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The B

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EDITORIAL

Red tape, red ink

No one but the bureaucrats benefits from bureaucracy. In the case of a major computer vendor — let's say DEC, for example — customers can come out on the short end of the stick when bureaucracy is allowed to flourish.

Case in point: We recently spoke with an IS director whose company struck a long-term deal with DEC a couple of years back. Asked about DEC's performance, the manager said it was "as required by the contract."

Asked further whether that performance might have been better had DEC not been preoccupied with its own market performance and corresponding financial woes during the past year, the manager's opinion was that her company probably didn't get the attention it would have if DEC's internal problems hadn't been so severe.

It's pretty clear from insiders and those who follow DEC from a distance that DEC is anything but a well-oiled machine where problems are resolved and decisions reached quickly and responsively.

Here's a little taste. I know of someone at DEC — a long-standing employee with considerable product and personnel management responsibility — who sought his own subscription to this newspaper. He was unable to make this decision himself, however, and had to have his request approved by his boss. And it didn't stop there: One more signature was needed from yet another higher-up. The request, by the way, was for the expenditure of the princely sum of $39 for a professional journal.

In fairness, this episode happened 18 months ago. But the stories persist of a multilayered bureaucracy that has evolved from the once-innovative matrix management style established long ago by company President Kenneth Olsen.

When asked about such matters and what he intends to do about it, Olsen becomes very testy, as evidenced in some recent interviews where he told the press and analysts to keep their cotton-picking hands off DEC.

Perhaps Mr. Olsen ought to try to understand that some newspapers and analysts represent the views and opinions of DEC's owners — the shareholders. They want to know if Olsen and Co. have a real plan to deal with stock that has been plummeting in value for three years and that by all accounts is still fishing for bottom.

Other cotton pickers, like this paper, represent the concerns of DEC's customers. They've seen the integrity of many a good company gutted in recent years by the failings of entrenched management teams that can't or won't cope with the cataclysmic changes in the computer industry.

These people vote with their spending power, and one look at DEC's falling revenue should show Olsen and others that their concern represents a lot more than some petty desire to meddle.

Bill Laberis

Bill Laberis, *Editor in chief*

LETTERS TO THE EDITOR

Take virus action

As an information systems veteran with 20 years of computer experience, a bachelor's degree in computer science, a certificate in data processing and an MBA, I am embarrassed by computer viruses. The only solution is common sense and detection. Nobody has a cure.

A recent *BusinessWeek* article describes the Russian nuclear industry. BW reports an incident where a computer virus invaded a nuclear facility. For two hours, the facility ran without computers. There were no major problems.

Some of the largest corporations — Microsoft, IBM, DEC, Apple, AT&T and Hewlett-Packard — develop operating systems. They must take action immediately. If they do not solve this problem, then our federal government must legislate to require it. Let us not wait for a computer virus to cause harm to our lives.

Terry Warns
Troy, Mich.

They were so lucky to be 'let go'

I read with great interest your article about laying off workers ["Advice for the '90s: How to lay off workers," CW, March 30]. I was particularly struck by the final paragraph, in which Brian Scott, president of Banks of Iowa Computer Services, Inc., remarked about the people he had recently laid off.

"The first round of IS people we laid off all found jobs at a higher pay rate and have ended up being real happy," Scott said. "It still amazes me, but every single one is making more money than when they worked for me. It hurts my feelings a little."

Poor Scott! Perhaps he would have felt better if they had all lost their homes. Never mind; perhaps he will get lucky and get "let go" too!

By the way, if you must fire someone, don't use cowardly euphemisms such as "let go." If you mean fired, then have the guts to say so.

Colin Davies
Simi Valley, Calif.

Scant maintenance drives customers away

In your article on Oracle's pricing policy ["Oracle policy prompts pricing worries," CW, March 23], one statement you make is: "Most users expect a certain increase in performance as part of their 15% software maintenance fee. But that fee just guarantees that software bugs will be fixed on time and that your calls to technical support will get answered."

Poppycock. Is your reporter lobbying for a new concept in software maintenance? "Fix our mistakes and answer the phone" doesn't "hack it."

A variant of that same ethic is probably why people drive Japanese cars and watch Japanese TV sets.

Encountering this ethic will probably cause a computer customer to change vendors.

B. G. Rutledge
Bartlett, Tenn.

Licensing would help retain jobs in U.S.

I strongly agree with Edward Yourdon's assessment in his article "Kiss U.S. coders good-bye" [CW, April 6] that "low-cost, highly productive, quality international competition will put American programmers out of work." The question is, how do you define quality?

Establishing a measurable quality level is one of the reasons I favor certification or licensing of software designers/engineers. Such mandatory certification or licensing would restrict the influx of foreigners who enter the computer system labor market as aliens without any established level of professionalism, aptitude or concern for the consumer's needs.

Also, the loss of jobs to offshore programmers could be controlled by requiring that offshore developed systems be certified by licensed software designers/engineers in the U.S.

Those whose opinions were included in Yourdon's article apparently are not aware that U.S. companies are sending millions of dollars of programming work offshore.

Leonard F. Turi
TMS Consulting Services, Inc.
New York

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Productivity: Faith isn't enough

JIM MANZI

At a recent PC conference, there was a dramatic moment when many of those in attendance began beating their arms against the air and saying that they were flying. This has become a familiar occurrence at industry conferences whenever the subject of computers and productivity comes up.

A Harvard economist was present at the most recent levitation. Amidst howls of protest, he stated — quite correctly — that the huge investments in information technology had not resulted in any gains in productivity and that no one in the room was, in fact, airborne.

Some of my industry colleagues tried to argue that PCs had indeed brought productivity gains but that you simply couldn't measure them. I don't totally disagree with that, but it has always been my view that arguments based on invisibility are best left to priests and rabbis, rather than your average software executive.

The payoff

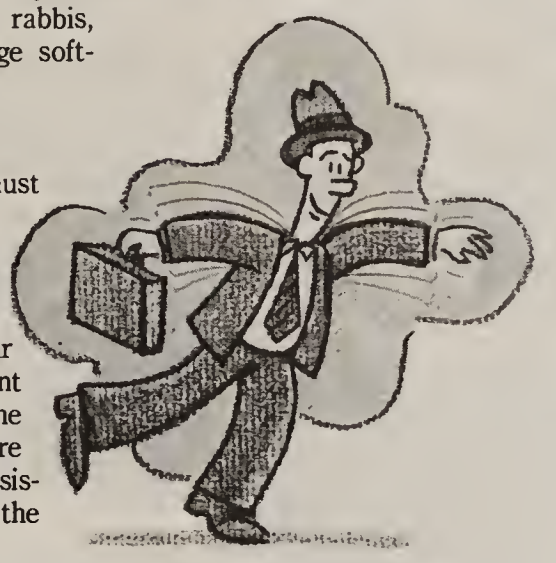
For those of us who must deal in the material realm, the lack of measurable gains from information technology presents a problem. Our customers have spent about $1 trillion during the past 10 years, and they are becoming increasingly insistent in asking, "Where's the payoff?"

The situation is not entirely hopeless. Leaving aside both theology and macroeconomics, I doubt there are many customers who would be willing to do without the PCs, word processors, spreadsheets, etc. that they have purchased in the past 10 years or who would say that things would improve if we stopped producing these technologies.

Partial excuse

We can also take some solace in a school of thought that has recently emerged in places such as the *Harvard Business Review* and the columns of *Computerworld* that the problem is not so much with the technology but with the management of that technology. A number of studies have shown that the relationship between computer spending and profitability is random. But there are still many highly profitable companies that spend large sums on computers.

Therefore, the key to productivity lies not in the computers themselves but in how they are used. "Use," in this instance, refers to how information technology fits into the overall structure of the organization and how it helps achieve organizational goals. The potential of information technology is realized only when that technology is integrated into the strategic vision of the organization and when it is used to redefine job structures, processes and lines of authority.



Illustrations: Michael Siggins

The fact that information technology must be managed wisely by no means takes our industry off the hook, however. The technology itself still matters. Integration into the organization presupposes technology that is capable of being integrated.

IS managers and CIOs, no matter how omniscient, are not capable of creating systems or achieving productivity gains out of void and nothingness.

Technology failings

It is tempting to believe that anything can be accomplished by proper management, but that is obviously a lot of B-school hubris. Noah may have managed the flood, but clearly the industrial revolution had more to do with new technology than new management techniques. In fact, the very word "manager" as it's now used did not even exist until baseball was invented in the mid-19th century.

Today's IS managers are constrained by technology — particularly software technology. They are constrained by incompatibility across operating sytems; they abut monolithic applications categories that don't correspond to the way work is actually done and by applications that tend to isolate users at their desktops rather than helping them work with others.

The productivity challenge for the software industry is to develop applications that overcome these constraints.

There is a need for applications that work across platforms, that work better together, that are less monolithic and can be "mixed and matched" and easily customized, and — perhaps most importantly — for applications that are group-enabled, that allow people to share information, knowledge and work itself more readily.

The good news is that all of this is beginning to happen, and it is no coincidence that many companies are beginning to see tangible gains from their computing investments.

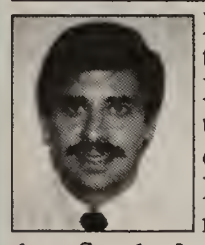
Networks and client/server architecture are redefining organizational computing and hold the promise of real — perhaps even measurable — gains for organizations.

If we can develop applications that take full advantage of this new model and that serve organizational goals, we will no longer have to pretend.

Manzi is president and CEO of Lotus Development Corp.

With a little luck, they could give Perot a run for his money

MICHAEL COHN



Everyone wants to talk about H. Ross Perot. He used to run his own company. Now he wants to run for president. So what?

I guess we're supposed to be impressed because he started out as just another computer salesman and now has more money than anyone — except maybe my mechanic — can possibly imagine. I say Perot was lucky. Right place, right time. Anyone could have done it. Heck, I might have parlayed my IS career into a billion dollars, had it not been for one lousy JCL error and three weeks worth of AR tapes. Before that one setback, I was going places.

I admit, Perot made it, and he made it in information systems. But I also say there are a lot of folks who might have done just as well except for bad data, bad timing or three weeks worth of AR tapes that should have been backed up in the first place. Let me introduce you to a few of the forgotten:

Myron Jobs: Few people know this, but years before Steve, his brother Myron almost made high-tech history by building what would have been the first PC on a kitchen counter in their home. But tragedy struck one night when the younger Steve innocently mistook the nearly completed device for a toaster oven, burying it and Myron's future under several ounces of steaming Cheese Whiz.

Ellen Olson: Ms. Olson, founder, president and model for her own chain of unprofitable "Very Big and Tall Gal" fashion stores, was frustrated with her IS department. Disgusted with high-cost software and low-reliability mainframes, she was convinced her live-in boyfriend, Seymour, could run the entire chain's computing from his PCjr in the den. And the couple might have been the first to stumble into the billion-dollar "downsizing" industry, had not Seymour suggested this particular buzzword one night while Ellen was enjoying her third sizable helping of triple layer fudge cake.

K. Thomas Crawford: Fed up with a go-nowhere career coding Cobol in Cleveland, Crawford created a line of high-tech clothing and made a killing in the world of high-tech fashion. He designed dresses with digital displays, mittens with mouses and scanner-equipped scarves. But then he introduced and demonstrated a young misses' touch-screen T-shirt before a huge crowd at Comdex/Spring and is now serving three to five in Youngstown State Penitentiary.

Bob and Barry Bornstein: The jury is still out on the Bornstein brothers. Until recently, they looked like sure bets to be the next high-tech billionaires. After 15 years of work on "B," which they modestly proclaimed the perfect computer language, the Bornsteins got their first contract to install an all-B production system 18 months ago. It was from the federal government — for an overdraft protection system at the Congressional Bank.

Cohn works for a very large computer company in Atlanta.

Property Inspection and Appraisal Form

Date 8/8/91

Inspected JOHN G. MILLER

Property Location AVE. DEVERE. 25 ST. PAUL

Number 4A61003

D. E. O'NEILL AGENCY

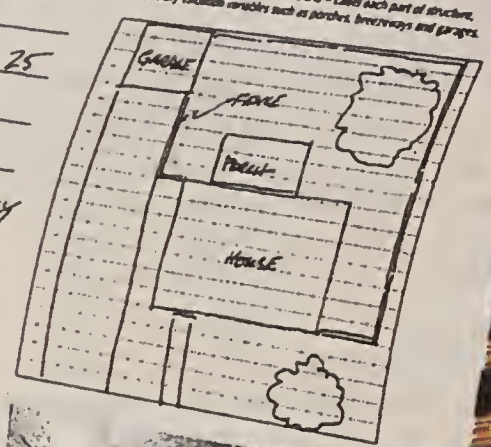
Number 3900HC

M. A. PETERSON

Pattern

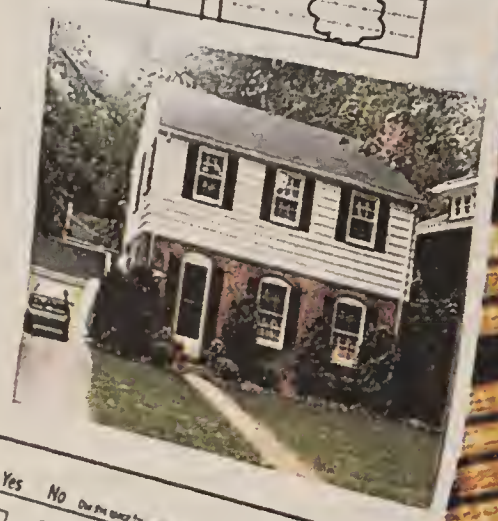
Draw Diagram of Ground Floor Area:

Diagram Instruction: Show dimensions – Label each part of structure, especially valuation variables such as porches, breezeways and garages.



Immediate Surroundings

- ☑ Subdivision
- ☑ Residential
- ☐ Isolated
- ☑ Stable



	Yes	No
	☐	☑
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Oct. 29, 1991
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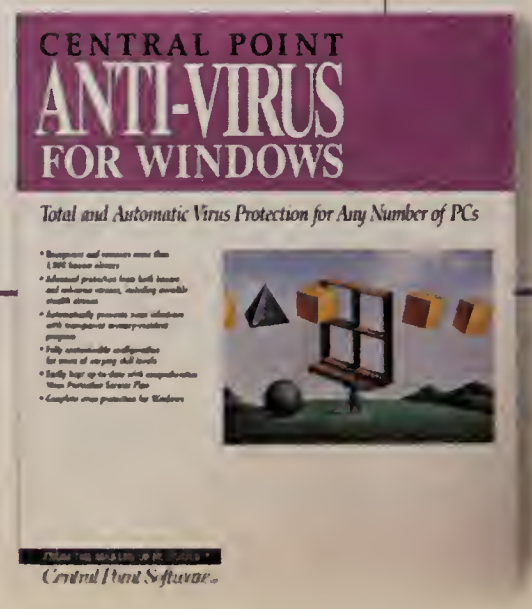


Apple set to preview handheld organizer PC

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. will begin moving into the consumer electronics market later this month when it previews an inexpensive, handheld computer that some sources say is the company's most exciting product since the original Macintosh personal computer.

The machine, code-named Newton, is an executive organizer that is about the size of a thin videocassette and will sell for about $700. It will include software that can read printed notes and then automatically add an appointment to a calendar, dial a phone or send a fax, sources familiar with Apple's plans said.

Newton will network with other PCs via a built-in fax and data modem or a wireless infrared link that can send and receive data up to six feet away. Later models will add voice recognition. "It's spectacular," said one user who had seen a proto-

Continued on page 34

IBM, Compaq face skepticism

BY CAROL HILDEBRAND
CW STAFF

IBM and Compaq Computer Corp.'s efforts at fence mending with price-conscious users may run into some snags: Despite the companies' efforts to date, it is hard for some users to imagine these fat-margin power hitters connecting with prices low enough to get into the clone ballpark.

The two behemoths' troubles have been dogging them for nearly a year, as consumers have said good-bye to costly top-tier personal computers in favor of more attractively priced offerings from such competitors as Gateway 2000 or Dell Computer Corp. IBM has lost five points in market share in the last six months alone, according to Computer Intelligence in La Jolla, Calif.

Efforts to regain lost market share have resulted in massive restructurings at both Compaq and IBM's PC division, with the new focus on getting to market machines that are within 5% to 10% of clone pricing. IBM, for example, has made its PC group independent enough to slash prices without going through corporate layers for permission. However, while users express interest in competitively priced IBM and Compaq systems, they reserve judgment on how competitive the two firms can get.

"I've always seen Compaq as the overpriced guys. I can't imagine them coming down to a reasonable price," said Michael Mourey, manager of technical support at Purdue University in Fort Wayne, Ind. Mourey mostly purchases Gateway machines.

As for IBM, Mourey said the Micro Channel Architecture makes him view Big Blue boxes as a whole different environment. "Their PCs do things a little differently than Gateway or Dell," he said, a factor that does not play well in a commodity market.

Kimball Brown, director of PC research at International Data Corp. in Mountain View, Calif., said that there is no question that Compaq will come close to the aggressive prices of clones. "If I can buy a Compaq for just a little more than Packard-Bell, then great. Compaq will meet the prices. The question is whether they can be profitable."

For Enrique Crespo Jr., corporate manager of user computing services at The Torrington Co. in Torrington, Conn., the thought of "Peter Pan Compaqs from the corner store" does not make him think that Compaq quality will trickle down from the higher priced lines. "I would have to take a hard look at it," he said. "I will not just change brands because the price is good." Crespo said he is pretty much leaning toward AST Research, Inc. machines.

Users cool to paid software support

BY ROSEMARY HAMILTON
CW STAFF

Corporate users do not like to pay for personal computer software support today, and they are unlikely to change their minds until they move to more networked environments, according to International Data Corp. (IDC) in Framingham, Mass.

In a recent IDC survey, users said hardware support is the most important service they receive today. Only 18% said they pay for any software support. IDC contacted 1,500 companies with 25 or more PCs and received 372 responses.

"The vendors set the stage by providing free help on applications and operating systems," said Rebecca Segal, an analyst at IDC. "The market sees this as something you should get for free."

Of those users surveyed, 64% said they would not pay for operating system support, and 67% said they would not pay for applications support.

Complexity counts

On the other hand, more users believe network software support is worth paying for. Of those users surveyed, 55% said they would pay for this support because they perceive it as a far more complex and critical part of their computing environment.

In fact, users said they expect networking-related support issues to surpass hardware as the No. 1 service concern within the next few years, Segal said.

However, Segal also said she expects a shift in user's perceptions as application software becomes more complex and takes more advantage of a networked environment.

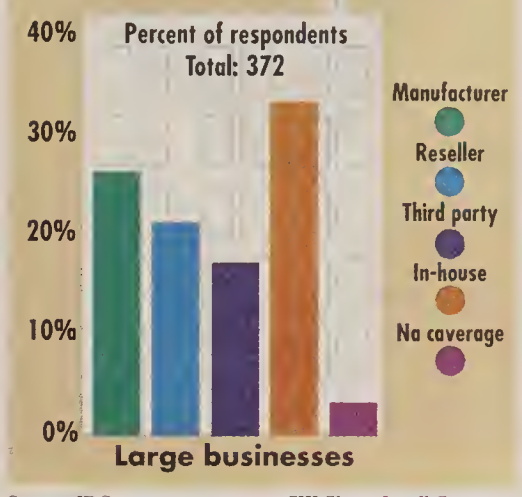
For example, the leading PC applications vendors are all now touting workgroup products and strategies, with Lotus Development Corp. in the lead with its Notes software.

"If a user is implementing something like Notes and it requires customization, they would probably have to use some kind of outside help," Segal said. "The more expensive the product, the more willing they will be to pay to support it."

With today's software support, respondents said their top three concerns are the timeliness of bug fixes, on-line Help and quality of documentation.

Homegrown

The most common choice for PC service in large companies is in-house support



Source: IDC

CW Chart: Janell Genovese

IBM boosts XGA effort with Intel deal

BY CAROL HILDEBRAND
CW STAFF

IBM's campaign to make its Extended Graphics Array (XGA) video-graphics design an industry standard received a shot in the arm recently when IBM announced an agreement with Intel Corp.

Intel will develop and manufacture new iterations of the XGA chip sets and will also put its marketing weight behind the XGA standards drive, said Kenneth B. Fine, vice president and general manager of Intel's multimedia and supercomputing components group.

"We will develop IBM's technology to sell additional XGA devices and eventually include XGA functionality on the same chip with Intel circuitry, chips, DVI, etc.," Fine said. The first product, which will be a discrete XGA product, is scheduled to be introduced in the first quarter of 1993.

The pact will not interfere with IBM's earlier exclusive licensing agreement with Inmoss, a division of SGS Thompson. Paul Mugge, IBM's vice president of technology for entry systems technology, said Inmoss' agreement encompasses a predefined set of XGA chips. Because Intel will be developing new sets, the license does not infringe on the agreement, he said.

According to Jon Peddie, editor of "The JPA PC Graphics Report," in San Jose, Calif., the move would help win user mind share. "It's significant for two reasons," Peddie said. "First, Intel is a humongous company, and second, the coupling of XGA and DVI is important." Peddle explained that XGA will serve as the display platform for Digital Video Interactive (DVI) images, such as full-motion video. DVI is jointly owned by IBM and Intel.

IN BRIEF

Intel profits dip in quarter

■ **Intel Corp.** posted increased revenue but a drop in profits for its fiscal 1992 first quarter, which ended March 28. The firm recorded $184 million in profits on $1.24 billion in sales. Last year, it earned $197 million on $1.13 billion in sales in the comparable period.

■ **Wang Laboratories, Inc.** recently unveiled two microcomputers built on chips from **Advanced Micro Devices, Inc.** (AMD). Both the PC 350/40C, priced at $2,345, and the PC 380/40C, at $2,600, are based on AMD's 80386DXL 40-MHz processor. Both machines can run Xenix, OS/2 and DOS.

Organizer PC

CONTINUED FROM PAGE 33

type. "Everyone I know will want one."

Although it will be shown to select distributors at the Consumer Electronics Show in Chicago May 28-30, it will not be available for sale until early next year.

Newton is not a version of the Macintosh but rather the first of what Chairman John Sculley calls "personal digital assistants," a new class of handheld devices that he first described in a keynote speech at the winter Consumer Electronics Show in January.

Japan's Sharp Corp., with which Apple recently announced an electronics alliance, will manufacture the device for Apple and eventually market a version geared toward a broader consumer market.

Newton represents an important and potentially lucrative new direction for Apple, according to one industry observer. "It's going to represent a new core technology," said Pieter Hartsook, editor of "The Hartsook Letter" in Alameda, Calif. "Apple has a good reputation for building warm and fuzzy electronics, and Sharp has an established distribution channel and skills in marketing consumer products. It's a great match."

Apple officials have stated before that the company is working with Sharp to build a personal information organizer but would not comment on the specifics.

Newton will also use a number of technologies being developed by Apple's Advanced Technology Group, including a neural network-based handwriting-recognition system. If a user prints a note such as "Lunch with Scott at noon Wednesday," the assistant will place the appropriate appointment in the calendar. "Call Scott" would provide a list of phone numbers and then dial the one the user touches. "Fax meeting schedule to Scott" would find the appropriate fax number and send the document.

The machine will also employ the fruit of another technological alliance — Newton's superfast microprocessor will be produced by a joint venture set up last year by Apple and chip makers VLSI Technology, Inc. and the UK's Acorn Computer Co., sources said.

Multimedia training: For good sports

BY CLINTON WILDER
CW STAFF

EL SEGUNDO, Calif. — Multimedia technology may not sound like the kind of thing that will sell more surfboards and ski poles, but a major West Coast retail sporting goods chain believes otherwise.

Big 5 Sporting Goods went live five months ago with an IBM-based multimedia system to train its in-store sales representatives and cashiers. Big 5 has trained 5,000 employees so far.

"Before, we really had no standardized training for the salespeople — it was mostly word of mouth," said Steve Pechter, vice president of MIS. Pechter presented the application at the recent Society for Information Management Southern California chapter spring conference on multimedia in Long Beach, Calif.

The Big 5 system uses IBM's InfoWindow touch-screen interface and combines text, graphics, sound and video. Big 5 purchased 65 systems to share among its 138 stores. Each system consists of an IBM Personal System/2 Model 50Z with a Pioneer Corp. laser disc player and an IBM dot matrix printer.

Michael Siggins

Pechter would not disclose the value of Big 5's multimedia investment but said cost-justification was a big issue in persuading the firm's management to approve the project. Training time for a point-of-sale cashier dropped from an average of eight hours to two to four hours. Other benefits he cited were reduced errors at the point of sale, better retention of skills and standardization of training across the company.

"We now know that salespeople in our store near the Canadian border in Bellingham, Wash., receive the same training as those near the Mexican border in Chula Vista, Calif.," Pechter said.

Cost-justifying multimedia training systems can be tricky and requires creative approaches, said John F. King, principal at Learning Systems Sciences, Inc., a North Hollywood, Calif.-based consultancy that works with Big 5. "You have to ask, 'What does it cost to do nothing?' " he said. "You have to use some vision and innovation to pull those numbers together."

King cited a Department of Defense study showing that military and industrial trainees retained 30% more information from interactive training than from classroom instructors, while college students retained 50% more.

"That might not translate well to cost-justification, but those people are 50% farther along," King said.

Big 5's multimedia application introduces employees to their training under the guise of a mock television sports program, "The Big 5 Sports Spectacular." After watching videos on the company history and organization ("the positions on our team"), employees are led through different training modules such as store goals, sales techniques, tips on nabbing shoplifters and on-the-job safety. "Our workmen's compensation claims have dropped," Pechter noted.

Sales by video example

The integration of video is exemplified by a section on using different sales techniques in different customer situations. Touching different numbers on the screen brings up films demonstrating each sales technique.

In the testing portion of the training, employees view videotaped hypothetical customers and then make on-screen selections of the most appropriate sales approach.

The system collects an "audit trail" of how each employee performs and tracks the system's ease of use by recording user response times and errors.

Arbor serves client/server data analysis

BY CHRISTOPHER LINDQUIST
CW STAFF

The usefulness of spreadsheets in financial applications is hard to doubt. That was on the minds of developers at Santa Clara, Calif.-based Arbor Software Corp. when they decided to create a client/server data analysis tool for use on high-end operating systems such as IBM's OS/2 2.0 and Microsoft Corp.'s Windows New Technology (NT), according to Arbor.

As a result, Arbor's Essbase data server resides on an OS/2 or NT server and functions as an add-in to tools such as Microsoft's Excel or Lotus Development Corp.'s 1-2-3 or 1-2-3 for Windows on the client side.

It appears as a menu item and uses the spreadsheet's own interface, controls and commands.

Spreadsheet database

Essbase manipulates data on the server by creating a multidimensional database of multiple spreadsheets. The user defines the structure of the database through an "outline" that creates a hierarchy of relationships between the various pieces of data, such as sales figures, geographic information, products and time periods. The outline is simply "drawn," and no programming is required.

One early user is *The Los Angeles Times*. After completing a downsizing project that eliminated its mainframe-based data consolidation tools, the newspaper had been compiling its budget information on personal computers with Lotus' 1-2-3 and Borland International, Inc.'s Paradox relational database. It involved some 400 to 500 spreadsheets.

This system worked, but it was not easy or terribly efficient. Paradox required considerable scripting, and report writing "was an ongoing chore," said Scott Heekin-Canedy, manager of financial planning at the newspaper.

Then Arbor offered *The Times* a chance to alpha-test Essbase. "We were dazzled by what they demonstrated, though somewhat skeptical," Heekin-Canedy said. The newspaper agreed to test the software, however, and Heekin-Canedy said he was soon converted from skeptic to believer. "It was too good to be true," he said.

Less of a learning curve

Essbase eliminated the need for scripting in Paradox, dramatically shortened the learning curve by allowing users to manipulate their data using the common spreadsheet interface and allowed them to load and consolidate their data in hours instead of days. The newspaper was so impressed, it used the alpha-test version of the product to produce its 1992 budget.

Data in the Essbase database can be updated dynamically and analyzed by drilling down to examine various cross sections of the multidimensional database.

Pricing for Essbase starts at $21,950 for a five-user simultaneous log-in server and 10 copies of client software.

Flash memory in that awkward phase

BY MICHAEL FITZGERALD
CW STAFF

Users looking to take advantage of pen systems and other devices that use flash memory cards will have to suffer through an industry in the midst of growing pains.

Flash memory is the solid-state, credit card-size circuitry that is beginning to be used as random-access memory or read-only memory. Flash memory can be used as conventional floppy or hard drives and is showing up with peripherals on it.

Compatibility confusion

In the wake of Intel Corp.'s recent flash memory announcement, it was revealed that not all flash cards will run in devices that have flash drives, even those that claim compatibility with the Personal Computer Memory Card International Association (PCMCIA) standard.

"It's not a finalized product," acknowledged Brendan McGuire, executive director of the PCMCIA in Sunnyvale, Calif. "Early editions could lead to inconsistent starts, but they will all eventually be 100% interchangeable. It's just software, not a form factor."

McGuire said the PCMCIA was handling several issues in committee right now that relate to making PCMCIA completely interchangeable. He blamed aggressive product managers for introducing products that they claim are standard before the standard is fully extant.

Ministor Peripherals, Inc. recently announced 1.8-in. drives that it claimed were compatible with PCMCIA standard Type 3, a standard that does not exist yet, for instance. Microsoft Corp. announced a Flash File System that will allow flash cards to accept desktop PC software, though this, too, will have to establish itself as a standard.

Other vendors are building solid-state drives that will read the disks, among them SunDisk Corp., and a new joint venture between Intel and Conner Peripherals, Inc.

Joint venture puts flash memory potential on display

Ronald Fisher can hold the future of flash memory in his hand.

Fisher, president and chief executive officer of Phoenix Technologies Ltd. in Norwood, Mass., has a mock-up computer developed through a joint project by Phoenix and Lotus Development Corp. that will take advantage of flash memory's versatility.

It offers a prime example of the so-called companion personal computers that will exist in part because of flash memory.

Driving it are read-only memory versions of LotusWorks 3.0 and other software, upgradable via flash cards. Two Personal Computer Memory Card International Association (PCMCIA) standard slots will serve as conventional floppy drives and can be used for use with credit card-size modems and other peripherals. Its random-access memory will be flash-based.

Fisher's mock-up is 6 in. by 10 in., with an 80-line, IBM Color Graphics Adapter-compatible display. The planned processor is a PC/Chip, an integrated 8086-class chip from Chips and Technologies, Inc. It was designed to run for 30 hours on three AA batteries and costs less than $700. "We think everybody with a notebook will sell these," Fisher said.

June arrival

Fisher said Phoenix expects the first flash-based products to appear in June, but widespread product announcements will not come until October and November, and products are slated to ship in January.

Ironically, one of the first companion PCs could come not from the Phoenix/Lotus initiative but from Dell Computer Corp., known to be working on a small portable.

Dell's portable could also fit in a class of PCs that are notebook-sized but at under 3 pounds weigh much less than today's machines. This class of machines would feature Video Graphics Array-compatible screens, 1.8-in. hard drives (PCMCIA drives would serve as floppy and peripheral drives), and run on nickel cadmium batteries.

MICHAEL FITZGERALD

NEW PRODUCTS

Data storage

Unison Information Systems Ltd. has released Opti/Max, a Small Computer Systems Interface (SCSI) 5¼-in. rewritable optical disc subsystem for Sun Microsystems, Inc. workstations.

Designed for use with the Unix workstations using the SCSI bus, the Opti/Max subsystem has a high-speed memory cache built into the controller that produces an average access time of 7.6 msec. Opti/Max can boot SunOS and comes with a target SCSI controller, processor, software for the Station Selection Code and cache memory.

Prices vary from $5,000 to 10,000, depending on performance capabilities.

Unison Information Systems
21 Walsh Way
Framingham, Mass. 01701
(508) 879-3200

PC system software

Applied Digital Data Systems, Inc., an NCR Corp. subsidiary, has announced a new version of Mentor PC/OS operating system. The Mentor PC/OS operating system is based on an enhanced implementation of the Pick operating system. The new version will be certified for specific IBM-compatible personal computers.

Pricing starts at $495 for a single user.

Applied Digital Data Systems
Systems Division
100 Marcus Blvd.
Hauppauge, N.Y. 11788
(516) 231-5400

Systems

Acculogic, Inc. has designed the Rampat-Plus memory expansion card for personal computers.

The card is compatible with XT/AT bus-based PCs and adds up to 16M bytes of random-access memory. According to the company, Rampat-Plus is small enough to fit in many laptop computers. It includes an installation disk that automatically configures the system with the new memory.

The half-size board costs $249.

Acculogic
13715 Alton Pkwy.
Irvine, Calif. 92718
(714) 454-2441

Datamedia Corp. has expanded its line of computer security and control products with Securecard/100.

Intended for mobile computing with notebooks and laptops, Securecard/100 requires use of an access disk and a password in order to access the system. Files can be encrypted, locked or decrypted with an encrypt utility feature.

Securecard/100 does not interfere with normal DOS operations and has suspended drivers for operation when in DOS character mode or under Microsoft Corp.'s Windows 3.0 and 3.1.

Securecard/100 costs $95.

Datamedia
20 Trafalgar Square
Nashua, N.H. 03063
(603) 886-1570

Database management systems

Approach Software Corp. has started shipping Approach for Windows, a stand-alone database for Microsoft Corp.'s Windows.

Approach for Windows can also be used as a front end to Borland International, Inc.'s dBase III and IV and Paradox databases, as well as Oracle Corp.'s SQL 6.0. Users build a database, produce reports and analyze information via calculation and management capabilities.

According to the company, the product has Powerkey Technology, which allows users to open, manipulate and report on any information on their network, regardless of file format, simultaneously with other users.

Approach for Windows supports Object Linking and Embedding and has customizable macro buttons that automate repetitive tasks.

The product costs $399.

Approach Software
311 Penobscot Dr.
Redwood City, Calif. 94063
(415) 306-7890

Software applications packages

SourceMate Information Systems, Inc. has enhanced its AccountMate business accounting software.

Version 3.5 includes general ledger, accounts payable, accounts receivable and sales order modules. Users can print accounts receivable invoices without vacating the sales order module as well as produce 12-period income statement reports and balance sheet comparison reports.

A single-user-compiled program costs $295 for each module. Single-user source code programs are $450, and multiuser source code or compiled programs are priced at $595. For $995, SourceMate is offering a five-pack bundle of single-user compiled general ledger, accounts payable, accounts receivable, purchase order and sales order modules.

SourceMate Information Systems
20 Sunnyside Ave.
Mill Valley, Calif. 94941
(415) 381-1011

Software utilities

Baler Software Corp. has announced new versions of Baler and BalerXE, its spreadsheet compilers.

Baler 6.0 includes a publishing module, a workbench menu for point-and-click access to Baler development tools, full mouse support and enhanced macro language support. BalerXE 2.0, an extended version of Baler for professional application development, adds the same features.

Baler 6.0 costs $495; BalerXE 2.0 costs $795.

Baler Software
1400 Hicks Road
Rolling Meadows, Ill. 60008
(708) 506-9700

Windows 3.1: Incremental but essential

Microsoft's Windows 3.1

Reviews	Performance	Ease of use	File management	Memory management	Compatibility	Utilities	Multitasking	Value	Overall
Infoworld 3/23/92	Faster	Just a little easier	Complete overhaul	Improved	NC	New features	Improved	Worth the upgrade	A better Windows than Windows
PC Week 3/23/92	Faster	Easier	Twice as fast as 3.0	Greater control	Certain applications difficult to install	Improved printing and networking	Better	Worth evaluating	Everything 3.0 should have been
Windows Magazine 4/92	Better	Simplified installation and configuration	Greatly improved	Lower resource usage	Enhanced DOS support	Improved	Improved	Worth upgrading	Addresses 3.0 problems
Users									
Ray Hammond, Electronic Data Systems Corp.	■■	■■	■▪	■▪	■■	■▪	■▪	■▪	Very good incremental release
Craig Hilleman, Du Pont Agricultural Division	■■	■■	■▪	■■	■■	■■	■▪	■■	Excellent
Glen Jurmann, Baxter Healthcare Corp.	■■	■■	■▪	■▪	■▪	■▪	■▪	■■	Improved file manager
Analysts									
Bobby Joe Reff, National Software Testing Laboratories, Inc.	■▪	■▪	■■	■▪	■■	▪	▪	■■	Print manager needs improvement
Karen Offerman, Datapro Information Services Group	■▪	■■	■▪	■■	■▪	■▪	▪	■▪	Nice step in the right direction
Scott Stein, Technology Investment Strategies Corp.	■▪	■▪	▪	■▪	■■	■▪	▪	■▪	Satisfies entry-level needs

Key: ■■ Very good ■▪ Good ▪ Fair ■ Poor

Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone surveys. NC: No comment.

Technology Analysis — A roundup of expert opinions about new products. Summary written by free-lance writer Emily Leinfuss.

Microsoft Corp.'s Windows 3.1 is faster and friendlier than its predecessor, Version 3.0. It is an incremental but essential upgrade that improves most of the features in the original version, including performance, memory management and integrated support for Object Linking and Embedding (OLE).

Performance: Windows 3.1 performance is much improved, thanks to better code and better disk utilities. As an example, one review said Microsoft's Excel launched about four times faster under 3.1 than 3.0. Support for DOS sessions within Windows 3.1 has also been upgraded.

Ease of use: Windows 3.1 was called friendlier than Windows 3.0. However, 3.1 falls short in its new interface design, *PC World* said. Its "fit and finish" upgrade is supposed to have ironed out the wrinkles in the Windows interface. For example, dialog boxes have been reworked and standardized and now feature separate scrollable file, directory and drive lists.

File management: File management has been slightly improved, but the new File Manager and Program Manager are still "clunky," according to *PC Week*. The main criticism is that the File Manager has not been integrated with the Program Manager desktop — so even though the version has added a drag and drop feature, printing or running a file still means opening, sizing and scrolling a bunch of windows.

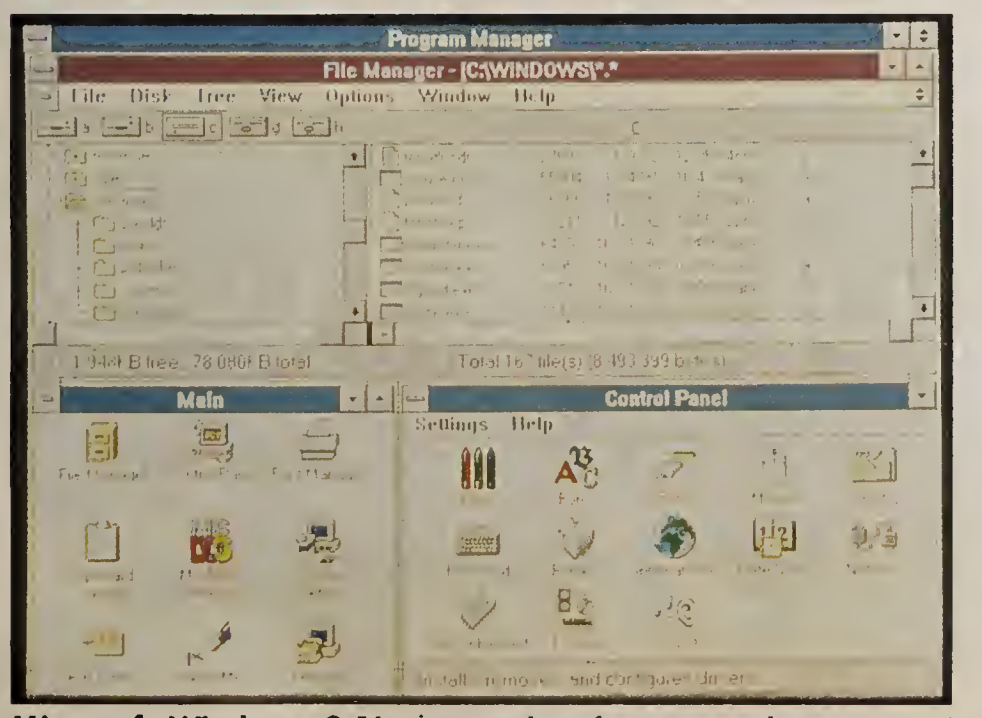
Memory management: The new version does not get memory messages nearly as often as the old because Microsoft has doubled the capacity of "System Resources" — the bookkeeping function that tracks how many applications, windows, dialog boxes and so on are open.

Compatibility: In Windows 3.1, OLE has been built right into the basic Windows applications, such as Write, Paintbrush, etc. Reviewers said OLE is a good interim solution but shows some signs of immaturity. For example, the procedures for embedding and linking pieces of data among many programs were far from intuitive.

Utilities: The newest Windows upgrade has built in much more stringent internal monitoring and recover routines that let 3.1 keep running if a minor fault occurs and even identify which application is causing the problem. Now, when an Unrecoverable Application Error pops up — a much rarer occurrence than in 3.0 — users can press function keys to shut down the windows and continue to work.

Multitasking: Multitasking has been doubly improved in Windows Version 3.1, primarily because of improvements in memory management. Specifically, the bookkeeping function that tracks how many applications are open has been improved so that if you had been able to run 4 windows applications before, you can run 8 or 10 now.

Value: Windows 3.1 offers better value than Windows 3.0 with its increased performance and memory management improvements. Reviewers encouraged current users to upgrade.



Microsoft Windows 3.1's *improved performance and management features make it a better value than Windows 3.0, reviewers said.*

Vendor financial ratings

Analysts	Short-term performance	Long-term stability	Outlook
Wendy Abramowitz, Argus Research Corp.	■■	■■	Very good
Rick Martin, Chicago Corp.	■■	■▪	Very good

Microsoft reported its ninth consecutive quarter of earnings growth with a 44% increase in profits, totaling $178.8 million, for its third quarter ending in March.

Microsoft responds

Joe Krawczak, product manager for Windows:

Ease of use: It was never our intent to completely redesign the interface. That is why we called it a 3.1 release rather than 4.0. Our goal was to take an interface that millions of users were using and liking and add the fit and finish improvement to make it smoother and easier to use. However, like any product, we will keep advancing Windows, and we will advance the interface in upcoming releases.

File management: If we were to completely merge file manager (FM) and program manager (PM) it would really be an overhaul of the interface, and we didn't want to do that. Instead, we took PM and FM, which we felt users were comfortable with and understood the paradigms of, and made dozens of improvements.

Compatibility: The reason reviewers didn't find OLE intuitive probably has to do with the fact that it is a new API set. When you roll out a new API, it takes time for new applications to come out that support that API.

OS/2 Version 2.0

On May 18, Technology Analysis will report on OS/2 Version 2.0, an ideal developer's platform but less cost-effective for lower level users, according to reviewers.

If you run database applications on a mainframe, we admire your patience.

Computers have spoiled us all.

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Still, the value of a Sun SPARCserver is not only that it keeps people working instead of waiting.

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And you don't have to worry about which database will run on your Sun SPARCserver, because software is available from all of the major DBMS vendors.

Look, computers impressed you once. A computer can impress you again. Call 1-800-247-8111 for our Database Performance Brief.

Go on, call. Your organization has waited long enough.

Sun Microsystems Federal, Inc.

*Among all the UNIX servers made today, the Sun SPARCserver 690MP recently scored the highest Transaction Processing Performance Council benchmarks for price and performance (TPC-A). Details will be included in the Database Performance Brief offered above.

'Enterprise' servers upgraded

Tricord models offer better I/O and possible view on long-term plans

BY MICHAEL FITZGERALD
CW STAFF

PLYMOUTH, Minn. — Superserver maker Tricord Systems, Inc. added six new servers to its product line and will beef up the line even more later this year as it prepares to go public, sources close to the company said.

The six new PowerFrames will feature enhanced I/O capabilities and improved availability through such means as redundant arrays of inexpensive disks (RAID) support at the controller level. The company's next offering will be a server based on Intel Corp.'s upcoming 33/66-MHz DX2 microprocessor, which will top the company's line of superservers, sources who have been briefed by Tricord said.

The sources said a next-generation Tricord server would arrive in the fall, after Intel officially announces its P5 processor. Tricord will probably maintain its architecture but will greatly improve its data throughput, the sources said.

Plans for expansion?

One source said he expects to see Tricord expand its number of processors. But other sources indicated that the firm was likely to make generally available only the same configuration it offers today on a customer-request basis: a three-processor system. Tricord refused to comment on rumors about new products or an initial public offering.

"The key to what we have been doing is to make a new class of machine, the enterprise server," said Larry Ingwersen, Tricord's chairman and co-founder. "The CPU is not the key to this class of machine. The network processing power and mass storage subsystem are the keys."

Tricord's architecture uses dedicated Intel microprocessors to handle communications and data I/O. It can support up to seven network processors and two Intelligent Input/Output Processors (IIOP) to enhance throughput. Last week's announcement included a new IIOP that has on-board, low-level support for RAID. The architecture also supports up to seven Extended Industry Standard Architecture boards.

Tricord also introduced its first Banyan Systems, Inc.-certified Vines servers, which are part of its plan to offer an interoperable server platform capable of working in a broad range of environments.

Bigger is better

One Tricord user said he was pleased to hear of the possibility of greater throughput coming later this year.

"I'm absolutely interested in the bigger machines. My biggest database has 16 million records in it, and using a [Nantucket Co.] Clipper index, if you had to drag that through the network, it would take you about 11 hours," said Keith Venzke, manager of Sato Settlement Plan administration at Sato Travel Corp. in Arlington, Va. Venzke said some client/server schemes have reduced his indexing time to less than two hours, but bigger servers would improve this further.

Tricord also announced a PowerSentry Management Console that will give network managers the ability to manage the network from any workstation on it.

One analyst said Tricord's future plans might help it maintain an edge in a $460 million market that firms such as NCR Corp., Digital Equipment Corp. and Hewlett-Packard Co. are expected to enter this year. "The whole concept of the superserver market is still in its infancy," said Lee Doyle, director of local-area network research at International Data Corp. "They're doing well right now, so if [Tricord] can stay ahead and continue to offer some unique value, they could do OK."

New models

The six new models that Tricord introduced last week include three that use Intel's I486DX2 25/50-MHz chip. Base prices for those models range from $27,490 to $33,990. They are the Model 40/50CB, the Model 30/50 C and the Model 40/50C.

The firm also announced the Model 30/25 EB, which is based on an I486 chip running at 25 MHz and features 16M bytes of random-access memory and 330M bytes of disk storage. Its base price is $17,450. The 30/CB and 30/33CB use the 33-MHz 486 chip and have 16M bytes of RAM and 256K bytes of secondary cache. Base price is $24,490. Four of the servers — the 30/CB, 40/50CB, 30/25EB and 30/33CB — are Tricord's first Banyan-certified servers.

PS/2 cards bring FDDI speeds to new market

BY JOANIE M. WEXLER
CW STAFF

MILPITAS, Calif. — IBM's Personal System/2 computers have joined the ranks of platforms that can connect to 100M bit/sec. Fiber Distributed Data Interface (FDDI) networks.

FDDI supplier Network Peripherals, Inc. recently announced Micro Channel Architecture-based adapter cards that have the option of operating in either a PS/2 or a RISC System/6000 running on the high-speed fiber local-area network. The products are available now.

To date, only IBM offers FDDI cards for the RS/6000. However, Network Peripherals' prices are just 58% to 68% of IBM's, and the announcement marks the first direct FDDI link for the PS/2.

"The beauty of the announcement is the dual personality" of the card, which will appeal to sites running both platforms, said Michael Andrews, FDDI product manager at Innova Communications, Inc., a systems integrator in Arlington, Va.

Overall, however, "the PS/2 is looking for an FDDI connection as much as any PC, which is not much," said Michael Howard, president of Infonetics Research, Inc., a consultancy in San Jose, Calif. He said the main FDDI application for personal computers today is for linking LAN servers on a dedicated high-speed network.

Good show!

In fact, Gordon Stitt, Network Peripherals vice president of marketing, said half his business is derived from LAN users putting Novell, Inc. NetWare file servers on a dedicated FDDI ring for high-speed intercommunications. The servers then link out to users on slower subnetworks.

"This facilitates client/server networking by allowing the distribution of applications across servers" while maintaining high performance between them, Andrews said. He added that his firm's sales history "clearly

Continued on page 42

Heavy metal

Copper wiring shows greater growth potential than long-promising fiber technology

Projected number of new U.S. cable connection shipments (in millions)

Cable type	1992	1993	1994	1995	1996
Fiber	.12	.13	.13	.13	.15
Voice grade copper	2.4	2.1	1.8	1.6	1.3
Data grade copper	2.0	2.7	3.7	4.8	6.0
Shielded copper	1.3	1.2	1.1	1.1	1.1
Total	5.8	6.1	6.7	7.6	8.6

Source: Forrester Research, Inc.

Intel's LANSight 3.0 supports LAN Manager, LAN Server

BY JIM NASH
CW STAFF

HILLSBORO, Ore. — With the latest version of its LANSight Support software, Intel Corp. has moved more fully into network management. Early users of the application applauded its new support for Microsoft Corp.'s LAN Manager and IBM LAN Server.

Introduced late last month, LANSight Support Version 3.0 enables network managers to take control of networked personal computers, inventory their contents and even remotely log on to host sessions. Version 2.0 provided similar support for Novell, Inc. NetWare networks alone.

Ray Smolskis, network manager for the Canadian Ministry of Transportation in Ontario, said the beta-test version he has had for the past month has performed well. It even offered some welcome surprises.

TSR friendly

Hooked up to his LAN Server network, Smolskis found that he could remotely log on to an Application System/400 midrange computer by controlling a second PC using AS/400 PC Support terminal emulation software. While the need to perform such a circuitous link might be small, it indicates that LANSight can work well with other terminate-and-stay-resident (TSR) software, he explained.

"I was surprised because PC Support takes up a lot of memory and is not always friendly to other TSR programs," Smolskis said. LANSight operates as a TSR at the client, and the PC he used to hook into the AS/400 was running network drivers in TSR roles.

The concept of LANSight is better than similar products such as Symantec Corp.'s Norton PCanywhere because it sits directly on the network, said Wing Mar, senior network engineer at Computer Network Systems, Inc., a NetWare and LAN Manager reseller in Burbank, Calif.

"The others are more modem-to-modem solutions," Mar said. LANSight, he said, has more security and management capabilities because it is part of the network. Mar also has had Version 3.0 in beta-test form for a month.

LANSight enables managers to remotely load programs, see how the desktop is configured and determine memory availability and hard drive size, he explained. In addition, users can operate in Microsoft Corp.'s Windows — both at the manager's PC and the user's. He said it is the first product he has seen with this range of capabilities that operates within Windows.

The software can be configured to restrict its use to certain managers and, on command, will notify end users that they are being monitored. It can also determine the log-on of a given user and that user's rights. Mar said LANSight should pay for itself within the first week, measured by improved productivity for managers.

The only drawback that Mar and Smolskis saw in the product was jumpy performance when remotely controlling PCs. Smolskis, who made the point, said it is a minor annoyance, but he would like to see smoother operation.

Like Version 2.0, the new edition costs $395 per server. It is shipping now, according to officials at Intel's networking division here.

RS/6000 watches Greenland health

IDG NEWS SERVICE

An IBM RISC System/6000 is at the heart of Greenland's plan for a health care system that links doctors, hospitals and pharmacies in a common computer system.

At the beginning of this year, the government of Greenland took over the country's health administration, which was previously run by the Danish government's health agency. Now, the government wants to modernize the system by creating a common filing system.

"Greenland is getting what is probably the most modern and coherent system in the world," said Torben Cordtz, director of the Environmental and Health Agency in Greenland.

The unique part of the system is the concept of a single file for each patient. The doctor uses the same file as the hospital and the pharmacy. The integrated system makes it possible to electronically send prescriptions to the pharmacy.

Because Greenland's population is 55,000 people, all data can be kept in one central database. Data is accessed by applications written in DataFlex, a fourth-generation language. Users will access the system from IBM Personal System/2s running Microsoft Corp.'s Windows. The system will eventually be installed in hospitals in Nuuk and Christianshaab.

Ads are the trade-off for lower system prices

BY ELLIS BOOKER
CW STAFF

LAURENCE HARBOR, N.J. — There is nothing unusual about selling computer hardware, software or automation support services to physicians.

But at least one company is using a novel combination of networking technology and multimedia-based advertising to keep its system prices low.

Since 1983, Physicians Computer Network, Inc. (PCNI) has reduced the prices of its computer and network equipment and services for physicians by requiring them to view, at their leisure, advertisements from drug companies, clinical laboratories and insurance carriers that have been downloaded monthly into their office servers.

PCNI uses IBM's Information Network (IIN) nationwide packet data network as the delivery vehicle for the advertisements, as well as for software updates to the practice management systems it markets to doctors. Publicly traded PCNI is about 25% owned by IBM, which conducts training and support for the service.

"There are some 60,000 doctors' offices with one to five physicians," said Jerry Brager, PCNI chairman and chief executive officer, describing his company's target audience. "We can supply them with the practice management software and hardware for a fraction of what it would take to [buy] it themselves."

He added that approximately 82% of PCNI's members have solo practices in which the expense of automation is often prohibitive. PCNI's yearly fee for a single physician is $2,760 and includes all support, software, peripherals and computer hardware: an IBM Personal System/2 Model 30 for the doctor and a PS/2 Model 80 running Unix as the server.

Cost savings were certainly important to Dr. Martin Edelstein, a solo practitioner in Great Neck, N.Y., who signed up for the service in June 1990 and is one of the 1,800 PCNI subscribers nationwide today. Edelstein said his office would have "drowned in paper" without computerization. The doctor reported that he spends about an hour per month watching the downloaded ads and has come to look forward to answering the educational questions that follow them.

In fact, the question-answer format is integral to the PCNI scheme: By answering questions, physicians are "verified" as having watched the 32 animated ads they are sent in any one month. Officially, PCNI requires a commitment of 90 minutes of watching the advertisement and answering questions each month. Doctors can also view additional clinical information on, for instance, a new drug.

Advertisers are charged an up-front fee for placing their advertisement on the network, as well as a per-view fee. In addition, PCNI supplies its advertisers with statistical summaries of the viewing patterns of its subscribers.

Future plans involve using the IBM Information Network, which the doctors' offices access with a 9.6K bit/sec. modem, as a gateway to other networks, such as those run by individual hospitals or medical associations. Already, PCNI serves as a gateway for electronic medical claims among the physicians' offices, private insurance carriers and Medicaid.

What if a doctor stops viewing the ads? They get a dunning phone call. To date, however, the company has not "deinstalled" a single site, according to Brager.

IN BRIEF

SyQuest inks SPARC pact

■ Disk drive supplier **SyQuest Technology, Inc.** in Fremont, Calif., recently joined the Scalable Processor Architecture (SPARC) workstation market through a marketing partnership with **Control Concepts Corp.**, a systems integrator based in Fairfax, Va. Control Concepts, a SyQuest reseller, markets single- and dual-drive external subsystems. It developed the Sun Microsystems, Inc. workstation interface and micro Small Computer Systems Interface connectors and cables required for SPARC-compatible peripherals.

■ **Bull HN Information Systems, Inc.** recently boosted the number of applications running on its Unix-based DPX/2 family of workstations and servers via joint marketing pacts. Mountain View, Calif.-based **Verity, Inc.** agreed to port Topic, its flagship document retrieval system, to the Bull line. **Modatech Systems, Inc.**, a sales force automation package maker in Vancouver, British Columbia, said its applications will be available for DPX/2 machines now.

PS/2 cards bring FDDI speeds to new market

CONTINUED FROM PAGE 39

backs up" the acceptance of using FDDI for a "server ring" configuration.

FDDI is still largely confined to backbones for concentrating lower speed subnetworks' data traffic and for communications between powerful workstations and other high-end computers running graphics, modeling, computer-aided design and manufacturing and other high-bandwidth applications. One reason FDDI has yet to hit the desktop is that while FDDI prices are continually dropping, they are still hefty. For example, the cost of a network connection generally is higher than that of the PC.

In addition, office environments have not yet become inundated with bandwidth-intensive applications to justify the expenditures, and most PC platforms do not have the capability to drive FDDI's high speeds, said Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington, D.C.

Howard predicted that PC FDDI connections would have to drop to below $1,000 per desktop to have broad appeal — a development he does not expect before 1994.

Network Peripherals charges $2,995 for a card linking either a PS/2 or an RS/6000 to one of FDDI's dual, counter-rotating rings via a network concentrator. This compares with IBM's $5,200 price for RS/6000 support only.

To determine per-desktop price in that type of configuration, however, users must add the price of the concentrator divided by the number of PS/2s linking to it.

For a direct dual attachment, the Network Peripherals card is $4,995, compared with $7,400 from IBM for linking just the one platform. Network Peripherals is also offering FDDI-like connectivity to shielded twisted-pair cabling for $2,995 per card.

FDDI hangs tough: Efforts under way to put technology on copper grades

A debate is raging as to whether FDDI on the desktop is destined to be bypassed for other technologies.

Some analysts predict, for example, that the Asynchronous Transfer Mode (ATM) switching technology designed to accommodate multimedia applications will leapfrog FDDI. "Multimedia is emerging faster than any of us imagined," said Frank Dzubeck, president of Washington, D.C., consultancy Communications Network Architects, Inc.

FDDI is not suited to the delay-sensitive nature of voice and video communications, while the cell-oriented nature of ATM is.

However, others believe ATM will not arrive at a palatable price point soon enough. Many agree it is the resolution of lower cost alternatives to standard FDDI — such as putting the technology on various grades of copper or implementing lower footprint fiber connections — that will spur FDDI-type implementations.

"Right now, the [unshielded twisted-pair] stuff is up in the air, and that's a big problem," acknowledged R. Bruce McClure, president of Alliant Consulting in Harvard, Mass., and an FDDI pioneer. "To get FDDI on the desk, we need to be able to tell the MIS director or whoever makes the buying decision what equipment he can buy for what types of cable."

McClure, a member of the American National Standards Institute (ANSI)'s FDDI committee, said that there are currently two proposals on the table for supporting FDDI networking services over unshielded copper.

The committee was still deciding between them at press time at its meeting in St. Petersburg, Fla.

Forrester Research, Inc. studies support McClure's view that resolution of the copper issue will drive FDDI adoption. The Cambridge, Mass.-based consultancy anticipates fiber FDDI connection shipments growing from 120,000 to 146,000 during the next five years, while data-grade copper FDDI connections will triple from 2 million to 6 million.

A proposal for a shielded copper-only solution was "soundly rejected by a 10-to-1 margin" by the ANSI committee, McClure said, because it was felt that users would like a single implementation that plugs into both shielded twisted-pair and data-grade Type 5 cable.

JOANIE M. WEXLER

NEW PRODUCTS

Local-area networking hardware

Bytex Corp. has announced the availability of Beacon Guard, a fault-prevention component of the Series 7700 Intelligent Switching System.

Beacon Guard works with 16M and 4M bit/sec. Token Ring local-area networks. With the Beacon Guard module, the Series 7700 detects and denies network access to any port using an irregular transmission frequency. It alerts the faulty station and the upstream node on the LAN and attempts to correct the problem.

The module is included free with Bytex 6- and 17-port Series 7700 hubs.

Bytex also announced Monitor 1.0, a monitor board that provides beacon detection and reporting and fault domain information. It is priced at $2,995.

Bytex
4 Technology Drive
Westboro, Mass. 01581
(508) 366-8000

Chipcom Corp. has created the On-line Ethernet FOIRL Module and Transceiver.

The Module allows users with Fiber-Optic Inter-Repeater Link (FOIRL)-based network configurations to connect to Chipcom's fault-tolerant On-line System Concentrator line of intelligent switching hubs. The FOIRL Module takes up one slot in the ONline hub and provides four fiber-optic connections. It can be assigned dynamically to any of three Ethernet networks on Chipcom's TriChannel backplane, the company said.

The Transceiver links a network node to an Ethernet local-area network over multimode fiber-optic cabling. The module costs $1,800; the Transceiver costs $495.

Chipcom
Southboro Office Park
118 Turnpike Road
Southboro, Mass. 01772
(508) 460-8900

NetWorth, Inc. has announced InstaLAN, a starter kit for 10Base-T local-area networks.

InstaLAN includes a nine-port EtherNext MicroHub, five 16-bit network interface cards and unshielded twisted-pair wiring. It works with Novell, Inc.'s NetWare operating system.

The kit costs $1,750.

NetWorth
8404 Esters Road
Irving, Texas 75063
(214) 929-1700

Applications packages

GeneSys Data Technologies, Inc. has introduced ImageExtender.

The client/server image storage and retrieval system can be integrated into existing applications running on personal computers, mainframes and minicomputers, the company said. It does not require additional programming. ImageExtender handles a variety of documents, including photographs.

Pricing for the system software starts at $2,995, depending on the number of users and the features selected.

GeneSys Data Technologies
Suite 400
4 North Park Drive
Hunt Valley, Md. 21031
(410) 785-0660

Data storage

Zetaco, Inc. has released Netstor TOFS 3.1, an updated hierarchical mass storage system for Unix networks.

The TOFS software runs on a Sun Microsystems, Inc. server and manages the distribution of files between magnetic disk and optical storage libraries. All operations are transparent to end users. The updated version handles files limited in size only by operating system constraints.

Pricing starts at approximately $18,000.

Zetaco
11400 Rupp Drive
Burnsville, Minn. 55337
(612) 890-5135

Mountain Network Solutions, Inc. has begun shipping FileWizard for FileSafe, an archive management software package.

The product runs on Novell, Inc. NetWare file servers. It incorporates scanning and analysis tools from Knozall Systems, Inc. with Mountain Network Solutions' FileSafe tape subsystems. The product transparently handles selection and migration of files from the file server to tape archive storage.

The price is $595 for a single-server version, $895 for three servers and $1,495 for eight servers.

Mountain Network Solutions
240 E. Hacienda Ave.
Campbell, Calif. 95008
(408) 379-4300

R Squared has announced new disk arrays for use with workstations from Sun Microsystems, Inc., Silicon Graphics, Inc., IBM and Hewlett-Packard Co.

The storage systems offer from 2 to 40 drives and support a fast Small Computer Systems Interface-II connection. Up to 630G bytes of storage can be incorporated.

Pricing ranges from $10,000 to $43,000.

R Squared
Suite 200
11211 E. Arapahoe Road
Englewood, Colo. 30112
(303) 799-9292

Local-area networking software

Rupp Technology Corp. has announced the development of FastLynx 2.0.

The file transfer product is compatible with DOS and Microsoft Corp.'s Windows 3.1 and includes new device drivers. It can also transfer files directly from station to station in a peer-to-peer network using a Novell, Inc. IPX network driver.

FastLynx ships with both parallel and serial cables. It is priced at $169.95. Upgrades cost $39.95.

Rupp Technology
835 Madison Ave.
New York, N.Y. 10021
(212) 517-7775

Artisoft, Inc. has started shipping LANtastic for NetWare Version 4.1.

The product offers Novell Inc. NetWare users LANtastic Version 4.1's peer-to-peer networking capabilities. Some of LANtastic 4.1 's features include new system management, immediate despooling, new print resources parameters and enhanced printer queue display.

LANtastic for NetWare Version 4.1 costs $499.

Artisoft
691 East River Road
Tucson, Ariz. 85704
(602) 293-6363

Peripherals

QMS, Inc. has announced a price reduction and a new networking option for its QMS-PS 2000 laser printer.

The 20 page/min. printer now costs $12,995, reduced from $15,995. The QMS-PS 2000 also offers a Multiprotocol Network Interface, which connects simultaneously to DECnet and Transmission Control Protocol/Internet Protocol environments through a single Ethernet printer interface.

The optional interface incorporates a Motorola, Inc. 68020 processor to manage Ethernet traffic received by the printer.

QMS
1 Magnum Pass
Mobile, Ala. 36689
(205) 633-4300

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*Based on suggested retail prices.** Please have your credit card and product package ready when you call. Offer expires September 30, 1992 or while supplies last. Education priced Lotus products not included. Not to be combined with any other offer. In Canada call 1-800-GO-LOTUS.

In Macintosh-to-IBM mainframe connectivity, there's only one company that leads the field. Avatar. Following our recent merger with Tri-Data Systems, we now offer the broadest range of Mac-to-mainframe connectivity solutions in the industry. From our cost effective MacMainFrame board-level workstation and gateway solutions, to RISC-based Netway gateway products, we have an answer for every price and performance configuration. All made to the most exacting standards—easy to install and Avatar. easy to use. Just as important, Avatar provides the responsive service and support you'd expect from a leader. To find out how to get your Macs talking with your mainframe, or to get our comprehensive "Macintosh-to-IBM Mainframe Connectivity Guide" call us now toll-free at 1-800-AVA-3270. Avatar. We're the Mac-to-mainframe leader with all the right connections.

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National ISDN rollout nears second phase

Bellcore-defined switch technology on its way to telephone companies; interoperability tests begin

BY JOANIE M. WEXLER
CW STAFF

The National ISDN-1 initiative is expected to shift into second gear next month, as industry-standard switches finally arrive at telephone companies and interoperability tests begin.

The moves mark the start of a six-month technical preparation for November's rollout of a nationwide Integrated Services Digital Network (ISDN).

November is targeted as the first milestone of National ISDN, an effort spearheaded by the Corporation for Open Systems to pull together a now-fragmented and long-coming digital national telephone network that will allow users to combine voice, data and video services on one circuit.

Consistency key

The Corporation for Open Systems, in conjunction with Bellcore, the research and development arm of the seven regional Bell operating companies, is seeing to it that all carriers and equipment vendors adhere to one set of Bellcore-released ISDN technical specifications so that consistent nationwide services can be deployed.

The network, while limited in November to just 24 local-exchange central offices nationwide, will start to address industry frustration with ISDN offerings that may be available in one area but not in others, said Mike Kilbane, president of the International Communications Association user group based in Dallas.

> "THE INDUSTRY IS still excited to see standard ISDN across regions. This has been a stumbling block."
>
> MIKE KILBANE
> ICA

"The industry is still excited to see standard ISDN across regions," he said. "This has been a stumbling block."

Eastman Kodak Co. in Rochester, N.Y., used ISDN for telecommuting, desktop conferencing and still-image transmission during a two-year, multicarrier trial in New York that ended last month, said Jim Briggs, senior engineer.

Briggs said he is looking forward to National ISDN addressing the problems caused by ISDN pockets being hooked up across the country by switched 56K bit/sec. circuits because of a lack of standard ISDN implementations. With the fragmented links, he pointed out, users give up about 16K bit/sec. of bandwidth on the non-ISDN route segment. In the case of a videoconference, "that extra 16K could go a long way for audio," he said.

With mixed ISDN/switched 56K bit/sec. service, Briggs added, "you don't share the ISDN intelligence, so any advanced voice features can't work through that arrangement."

All three major long-distance carriers — AT&T, MCI Communications Corp. and U.S. Sprint Communications Co. — will be providing the interregion ISDN linkages in November.

In the shadow of other technologies that have been developed in the decade-long ISDN ramp-up, ISDN's arrival looks to be greeted halfheartedly by many users who are at a loss to identify widespread applications.

Continued on page 46

Matson ships sail away with few delays

BY GARY H. ANTHES
CW STAFF

HONOLULU — When a Matson Navigation Co. ship is more than an hour late leaving on its five-day voyage from California to Hawaii, the skipper is required to telephone the chairman of the board and explain why. Not surprisingly, Matson's ships generally sail on time.

"Schedules are the lifeblood of what Matson sells," said William D. Gage, associate director of information services. Carrying that lifeblood are computer and communications systems built for customers who demand that their goods be delivered promptly and who insist on knowing where they are at any moment.

Matson, the principal carrier of containerized cargo and automobiles to Hawaii, has applied some straightforward technologies — electronic mail, fax and local-area networks linked to a mainframe — in innovative ways to meet those objectives while managing the shipment of some 400,000 containers annually.

The 110-year-old, $550 million company has also perfected some more esoteric areas of technology. The 600-plus trucks that pass daily through the gates of Matson's sprawling terminal here carry electronic tags that signal to a computer their weight, dimensions, identification numbers and other information. That data updates Matson's Customer Management Information System (CMIS), container-tracking software that runs on LANs at Matson terminals here and in Seattle, Los Angeles and Oakland, Calif.

Matson, a subsidiary of Alexander & Baldwin, Inc., is based in San Francisco. However, all shipments funnel through Honolulu, which four years ago had become the company's bottle-

To page 47

Gary H. Anthes

Matson's Gage (left) and Schmidt *help ensure that ships run on schedule*

ON SITE

Matson Navigation Co.
San Francisco and Honolulu

- **Goals:** To keep ships running on time and to be able to tell customers where their goods are.
- **Technology:** Electronic tags identify trucks as they pass through Matson facilities, and LAN-based applications track containers.
- **Future:** Tags will be added to containers to further automate tracking.

IBM readies software distribution package

BY ELISABETH HORWITT
CW STAFF

AUSTIN, Texas — IBM is preparing a centralized software distribution management offering that company officials said will be a marked improvement over its existing NetView Distribution Manager and other distribution packages.

Scheduled for delivery by year's end, Configuration, Installation and Distribution (CID) is said to allow information systems managers to centrally manage the distribution and installation of operating system and applications software to workstations throughout the corporation. The product will distribute software to computers running OS/2, DOS or Microsoft Corp.'s Windows and remotely configure them, according to Al Rosen, a program manager for systems management at IBM.

Distribution can be handled either from an IBM host or from an OS/2 server on a local-area network, he added.

"This is very different from [IBM's] Distribution Manager or [Tangram Systems, Inc.'s] AM:PM," Rosen said. "Those are just products to automatically distribute code that is already installed on the administrative machine."

In contrast, CID maintains a library of system software and applications used throughout the company and can automatically distribute whatever combination of software the administrator or user requests, Rosen said. In addition, CID maintains an information base of corporate workstation configurations, which it can use as the basis for updating software on an existing workstation or for establishing a "pure new workstation" from the ground up, he added.

Users waiting

"CID has been needed for quite a long time," said David Passmore, a partner at Ernst & Young. "Users have been clamoring for enterprisewide software distribution and management capabilities. Quite frankly, few vendors are in a position to create that type of product because you need to know how to program on mainframes and on OS/2 and know SNA communications as well."

IBM's existing Distribution Manager product is "very limited" and was designed primarily for distributing new code to IBM 3174 Establishment Controllers — not software to OS/2 or DOS, Passmore said. "DM doesn't let you know if the software is installed properly on the other end."

One of the risks run by administrators who use Distribution Manager is that when they ship new software to replace the old on a workstation, the shipment can potentially wipe out existing software that the user has configured without the administrator's knowledge, Rosen said.

Toys R Us shifts to satellite network

BY THOMAS HOFFMAN
CW STAFF

While corporate growth may be desirable, it can lead to more work and new ways of doing business that require a shift in network strategy.

Such is the case at Toys R Us, Inc., the $6.1 billion Paramus, N.J.-based toy specialty chain. The company has swelled to 497 toy stores in the U.S. and 126 sites internationally. In addition, the firm runs 202 Kids R Us children's clothing stores in the U.S.

To deal with its growth and to back up its existing terrestrial leased-line network, the firm has decided to deploy very small-aperture terminal (VSAT) communications technology worldwide. The firm hopes the technology will allow it to more easily distribute information among its Rochelle Park, N.J., data center and its outlets.

To provide a hub to manage that network traffic and process the information coming in from the field, Toys R Us recently purchased a Unisys Corp. A19 mainframe and other related equipment at a cost of $6.5 million.

The mainframe will coordinate data exchanges, such as orders being sent from stores to distribution centers, and will run a homegrown merchandising system that analyzes the stores' sales data and then forecasts market trends, supports buying decisions and helps distribute merchandise to the stores.

Dennis Healey, vice president of merchandise information systems at Toys R Us, said the company hopes to have the VSAT network in place by the spring of 1993. The company has not yet signed a contract for the satellite services; however, Healey said, Hughes Network Systems, Inc. has achieved successful test results and is the front-runner to win the contract. The contract will hinge largely on transmission testing with 100 to 200 Toys R Us outlets later this year, according to Healey.

International link

The network will eventually connect data center activities with the company's international toy stores in Europe, Japan and South America.

Healey said the decision to move to the satellite network was not prompted by anticipated cost savings or a return on investment. "We're an international company, and satellites clearly help us operate as a true global company," he explained.

Unlike other large retailers, such as Kmart Corp. and Wal-Mart Stores, Inc., which have been using satellite network services to link their operations for many years, Toys R Us has been slow to deploy the technology.

"Because of the proximity of our distributorships to our stores, we never had to use satellites," Healey said. A Toys R Us analysis several years ago showed that a VSAT network would not be cost-effective until the company had 300 outlets.

Healey said the company will also have to add T1 capacity for communications among the satellite network and the company's other systems.

Initially, the Unisys A19 mainframe, which is supplementing a three-processor Unisys A17 computer, will be used at the Rochelle Park data center. The system will eventually be moved to a nearby location that will also house the hub earth station.

The A17 mainframe will continue to be used by Toys R Us for other applications. An impetus for purchasing the A19 hub, Healey said, was its disaster recovery strengths.

At present, the company communicates with its field operations through high-speed leased-line services that enable headquarters, stores and warehouses to share data.

The bulk of the information is transferred over a Digital Equipment Corp. DECnet network.

Healey said the major telecommunications breakdown suffered in Illinois a few years ago because of a fire at a suburban central office "made us realize that we shouldn't rely on one communications system."

The company links its multivendor equipment using "homegrown" connections, which operate much like an Ethernet environment, Healey said. The company's four IBM Application System/400 midrange computers in Rochelle Park handle financial packages, while corporate information resides on the Unisys mainframes.

Toys R Us, Inc.
Paramus, N.J.

- **Challenge:** To link 497 North American stores and 18 distribution centers with corporate headquarters.
- **Technology:** A wide-area satellite network tied into a Unisys mainframe.
- **Goals:** Maintaining an adequate supply of "hot" products in its warehouses and stores during the Thanksgiving-to-Christmas time frame.

DEC central

However, Healey said Toys R Us is primarily a DEC shop, with more than 1,500 DEC MicroVAXes and 12 VAXclusters located thoughout the world. The company upgraded most of its VAX equipment — used primarily for data collection — last summer.

This distributed computing network of VAXs, Healey said, "has allowed us to evolve part of our mainframe information with our users."

Healey said DEC and Hughes have been working closely on the project to ensure Ethernet compatibility. The wide-area network will handle the flow of data from each of Toys R Us' multivendor environments.

ISDN nears second phase

CONTINUED FROM PAGE 45

For example, according to the director of network services at a large Southwestern conglomerate, "Some applications are coming that are unique to some businesses, but we're not waiting for ISDN with bated breath because of a pent-up demand."

"I get anxious about a technology that's been around so long, what with the rate of [technology] change," added Howard Maynard, senior vice president and director of MIS at Young & Rubicam, Inc., an advertising agency in New York.

Although Young & Rubicam was an original participant in the New York ISDN trial, "we have no active plans" for ISDN in the U.S. at this time," Maynard said. The firm hopes to leverage public frame-relay services through a multiprotocol router network now under construction.

When the ISDN is turned on during the third week of November, 80 firms using ISDN will let interested users view how they are using the technology. Those participants are scheduled to be announced early next month at the North America ISDN Users Forum meeting in Washington, D.C.

CNT, Network Systems improve backup tools

BY ELISABETH HORWITT
CW STAFF

Rivals Network Systems Corp. and Computer Network Technology Corp. (CNT) have both announced enhancements to their centralized backup and restoral products.

CNT, based in Maple Grove, Minn., has announced an enhancement that allows its Channelink channel-attached networking product to support links of up to 4.5M byte/sec. over unlimited distances, between hosts and high-speed direct-access storage devices (DASD). Such links enable companies to set up DASD backup-and-restoral facilities at geographically dispersed locations so that, for example, an earthquake does not take out both the primary and backup facilities.

Channelink boxes can connect the primary and backup data centers to the same DASD facilities, allowing the backup center to "begin backup processing immediately" after the primary center goes down, CNT spokesman Doug Anderson said.

Given the expense of 45M bit/sec. T3 links and hardware, users can limit such live backup to critical applications and use the same Channelink boxes to set up lower-speed links to traditional tape backup facilities for less critical applications, Anderson said.

Flexible support

Network Systems announced a similar long-distance host-DASD link — the first in the industry — last fall. However, unlike its rival product, Channelink requires no special mainframe software to provide a long-distance, high-speed DASD connection, Anderson said. This reduces mainframe overhead and enables Channelink to support virtually any IBM mainframe operating environment, he added.

Network Systems spokesman Don Flanagan said his company chose to use host software for its product because the software ensures greater efficiency by allowing the system to send both the data and the read-write commands to the storage device in one trip. He added that Network Systems also supports Fiber Distributed Data Interface links.

Channelink will support nearly all commonly used DASD devices by either the third or fourth quarter, CNT said. These include the following: 3380/3390 disk systems from IBM; disk-array products such as Iceberg from Storage Technology Corp.; and solid-state disk drives from EMC Corp. and Storage Tek. Pricing ranges from $81,000 to $150,000 for a Channelink system with remote DASD support and interfaces to high-speed, long-distance connections, CNT said.

> CHANNELINK REQUIRES NO special mainframe software to provide a long-distance, high-speed DASD connection.
>
> DOUG ANDERSON
> CNT

Network Systems, based in Minneapolis, has announced enhancements that enable its Central Archiving system to provide automated backup and restoral of files on networked personal computers and Novell, Inc. servers. Previously, it only supported Unix systems.

Central Archiving is said to allow network managers to back up and restore individual files, specified directories or entire volumes on a central IBM MVS or VM mainframe, Digital Equipment Corp. VAX/VMS system or a Unix host. The software is a feature of User-Access software for file transfer and backup that runs on Transmission Control Protocol/Internet Protocol (TCP/IP) and other network transport protocols.

Pricing ranges from $2,000 to $25,000, depending on configuration. Archiving for DOS and NetWare is available now.

Protects TCP/IP network

Network Systems also announced Network Control Facilities software that is said to implement security on its 6000 series of bridge/routers. A Packet Control Facility module is said to use a filtering technology to limit what types of users can communicate over a TCP/IP network. Factors to determine access include datagram length, source and destination ports and protocol type.

A Bridge Control Facility module is said to provide similar filtering capabilities for bridges that support a range of local- and wide-area networks.

Network Systems said it also plans to announce support for frame relay and Switched Multimegabit Data Service fast packet technologies for its 6600 series routers at the Interop East '92 show later this month.

Matson ships sail away with few delays

CONTINUED FROM PAGE 45

neck, with thousands of weekly container shipments accounted for manually.

"We were choking on paper. The volume crushed us," said Bill Schmidt, senior systems coordinator.

CMIS was developed in Honolulu and was later deployed to Matson's other port sites.

Last year, Matson outsourced its San Francisco mainframe operations to IBM. According to Gage, that has produced "significant" cost savings, given better backup and allowed Matson to tap into the latest data center technology.

CMIS automatically generates file transfers and E-mail. As transactions occur locally, they are stored in a file and are sent to a master database on the mainframe every 15 minutes.

Shipment information is also sent from the originating terminal to the next port of call, and summarized data about a shipment is sent by E-mail to Matson management.

> "THIS BUSINESS IS conceptually very simple. The ships don't go very fast, and there aren't many of them. But there are lots of containers, and there is a lot of information to know about each one."
>
> BILL SCHMIDT
> MATSON NAVIGATION

CMIS is configured so that all processing related to a shipment can continue without mainframe support.

The system proved useful when the mainframe was down for 1½ days after the 1989 San Francisco earthquake.

Info available

The Honolulu copy of CMIS automatically generates about 400 fax transmissions daily. Customers get periodic status reports by fax and can also call into CMIS at any time and request a faxed report on their shipments via a Touch-Tone telephone.

In Honolulu, a 3Com Corp. LAN of 180 nodes spans four buildings. Nodes are predominantly 80386-based personal computers.

The LAN is tied to the mainland mainframe through a Digital Communications Associates, Inc. 3270 gateway and a 19.2K bit/sec. leased line. Local personnel have real-time access to any mainframe application via CICS, an IBM transaction-oriented mainframe system.

"This business is conceptually very simple. The ships don't go very fast, and there aren't many of them," Schmidt said. "But there are lots of containers, and there is a lot of information to know about each one."

Matson is in the process of attaching electronic tags like the ones it has on its trucks to each of its 25,000 containers. The company is experimenting with a crane-mounted system that would log each container as it is moved on or off a ship.

The next step is to automate yard information in order to better plan and track the location of containers and equipment on the terminal grounds, Gage said.

Matson is looking at a system that would put a radio-based mobile data terminal in the hands of the operators who move containers.

The operators would take direction from a "yard planning" system, now being evaluated by Matson, by periodically pushing a button to learn where to go for the next container and where to put it for optimum use of space. At the completion of a container move, the operator would signal the results to CMIS.

NEW PRODUCTS

Gateways, bridgers, routers

Shiva Corp. has lowered the price of its NetModem/E communications server.

NetModem/E allows remote users to dial in and utilize network resources as if they were locally attached. It can also route IPX and Apple Computer, Inc. AppleTalk packets over standard telephone lines.

The price is $1,699, cut from $2,299.

Shiva
1 Cambridge Center
Cambridge, Mass. 02142
(617) 876-1188

Gandalf Technologies, Inc. has created the LANline 5220 Ethernet bridge.

The bridge operates in local and remote configurations. Standard features include network traffic compression, Simple Network Management Protocol Management Information Base II support, dual wide-area network links and a filter table that handles up to 2,000 network addresses.

The stand-alone unit is priced at $2,295.

Gandalf Technologies
Suite 9
Cherry Hill Industrial Center
Cherry Hill, N.J. 08003
(609) 424-9400

Network management

Concord Communications, Inc. has enhanced its Trakker internetwork monitor.

Trakker is an internet monitor that keeps track of network activity in real time.

The company has added the Trak/Trace protocol analyzer module to the Trakker product line. Trak/Trace traces and decodes eight Ethernet local-area network protocols, including Transmission Control Protocol/Internet Protocol, Digital Equipment Corp.'s DECnet, Novell, Inc.'s NetWare and Apple Computer, Inc.'s AppleTalk. The module helps filter LAN packets and present them to the administrator in a readable form, the company reported.

The Track/Trace module costs $8,000 plus $500 for each Trakker segment monitor.

Concord Communications
753 Forest St.
Marlboro, Mass. 01752
(508) 460-4646

Customer-premises equipment

Digital Access Corp. has announced Switched 57, a line of communications products that connect desktop devices over digital telecommunications services.

The line includes data service units (DSU) and asychronous to synchronous data converters. The products connect to personal computers and workstations via the serial port and offer data transmission speeds of up to 57.6K bit/sec.

According to the company, Switched 57 products function like dial-up and dedicated line modems and require no changes to the microcomputer hardware or software.

The DDS 57 asynchronous DSU costs $1,595. The SA 57 converter pricing ranges from $495 to $695.

Digital Access
Suite 200
11501 Sunset Hills Road
Reston, Va. 22090
(703) 471-5010

Micro-to-host

Cleo Communications, a division of Interface Systems, Inc., has announced an improved version of its 3270LINKIX software. The product allows Unix systems on Novell, Inc. NetWare networks to function as IBM 3270 terminals.

The software connects via a Transmission Control Protocol/Internet Protocol adapter board to NetWare for SAA Version 1.2 running on a NetWare 3.11 server. The Santa Cruz Operation's SCO Unix is initially supported, with additional variations of Unix to be supported in the future. CLEO 3270LINKIX allows terminal emulation users to access NetWare's security and network management features.

Pricing is $2,995 for eight users, $4,995 for 16 users and $7,995 for 64 users. Each user can open multiple host sessions.

Cleo Communications
3796 Plaza Drive
Ann Arbor, Mich. 48108
(313) 662-2002

X Window systems

Starnet Communications Corp. has added support for FTP Software's PC/TCP and Sun Microsystems, Inc.'s PC-NFS products to its MicroX line.

MicroX provides X Window System server capability for personal computers. The MicroX-386-NFS and MicroX-386-TCP products cost $345 each. Color and high-speed monochrome versions are available. The software runs under DOS.

The company also offers X server software for users who do not already have Transmission Control Protocol/Internet Protocol communications software installed.

Starnet Communications
3073 Lawrence Expressway
Santa Clara, Calif. 95051
(408) 739-0881

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Bull beefs up service to woo back wary users

BY KIM S. NASH
CW STAFF

PARIS — "At your service" is the new motto at Groupe Bull.

In one incarnation or another, the vendor has lived off sales of mainframe-class hardware running proprietary software for more than three decades, covering the life span of Bull and predecessors such as the computer operations of Honeywell, Inc. and General Electric Co. However, the reorganized company — which, at 38,000 employees, is 9,000 bodies lighter than it was a year ago — now wants to be a single-stop open systems integrator.

Yet if the customer is always right, Bull might be in trouble.

Random interviews with 10 longtime Bull mainframe users indicated that there is skepticism surrounding the company's viability as a service provider. Also, most of the users said they are happy with current machines and will not jump to the new ones Bull recently introduced.

Both factors will probably contribute to Bull's racking up losses for several more quarters, according to analysts. The company recently reported a 1991 deficit of $592.6 million; this was a 50% improvement over 1990's loss of $1.2 billion.

Bull reshuffled operations in January to form five "customer-oriented" units (see chart).

Sales push

Right now, sales for the five groups total $417.5 million, about 6% of which is from service and software, according to Ward MacKenzie, executive vice president of Bull HN Information Systems, Inc.

"We want to raise the service revenues for each unit to somewhere around what it is for Telecom, which is about 40%," MacKenzie said.

At a recent user group meeting, Bull officials said the company is among the top 10 systems integrators and that they want to boost that business during the next five years. They declined to specify any target revenues, however.

Bonnie Digrius, program director for systems integration at Gartner Group, Inc., confirmed that Bull's $300 million in 1991 worldwide systems integration revenue put it at the bottom half of the top 10. "Their strategy is right on target," she added.

A top-level executive commitment to integration as well as programs honed to vertical industries give Bull "a better chance than other hardware vendors" to make a go of the integration strategy, Digrius said.

"But Bull is still second-tier. IBM and DEC are very established, so Bull will have to fight hard," she added.

To help the push, Bull has put all its service groups — including Integris, a systems integration organization formed late last year — under one roof. Bull said it recently won "a major" contract from Southern New England Telephone to integrate Digital Equipment Corp. VAX and IBM MVS equipment with Unix systems and personal computers running Microsoft Corp.'s Windows. MacKenzie declined to put a dollar value on the account.

MacKenzie said the telephone company had no previous business with Bull, which "beat out" IBM and DEC for the deal. This kind of contract — a site signing up for Bull services de-

Continued on page 52

Bull's revamp

New lineup includes:

- General Accounts handles most of Bull's estimated 3,000 U.S. users. **Sales: $115 million; service revenue: less than 1%.**
- Major Accounts addresses three primary users: Honeywell, General Electric and Deloitte & Touche. **Sales: $81.7 million; service revenue: 2%.**
- Commercial handles 47 large accounts that are leaders in their vertical industries, such as Metropolitan Life Insurance. **Sales: $96.9 million; service revenue: 1%.**
- Telecom focuses on regional Bell operating companies, alternate service providers. **Sales: $33 million; service revenue: 40%.**
- Public Sector handles turnkey solutions for health care, education and legal groups. **Sales: $90 million; service revenue: 3%.**

CW Chart: Michael Siggins

Banking firm tightens belt, makes technology prove itself

Alan Levenson

Sanwa Bank *Senior Vice Presidents Harada (left) and Cordle 'do more with less' by using proven technology*

ON SITE

BY JEAN S. BOZMAN
CW STAFF

LOS ANGELES — Sanwa Bank California is dealing with the U.S. recession by taking the safe road while maintaining steady progress toward its destination of higher business volume. The bank's information systems managers practice and preach a pragmatic philosophy: Avoid the leading edge of technology, but be careful not to fall behind the technology curve.

The bank, California's sixth largest with $7.4 billion in assets, is a U.S. subsidiary of the Sanwa Bank Ltd. of Tokyo. The parent bank recently revealed plans to purchase $75 million worth of IBM mainframes and IBM RISC System/6000 workstations. But its data center in Monterey Park, Calif., will not gain any new mainframes as a result of those acquisitions.

The Tokyo bank is creating a global network for digitized voice and data to link branches in money center cities, including New York, Chicago, San Francisco, London, Hong Kong and Tokyo.

While Sanwa Bank California will tie into that network, growth of its own consumer-oriented business will be the most important factor in its future investment in computers. The bank achieved a $38 million

Continued on page 53

Lesson learned from flood

Huge productivity losses point to need for broader disaster recovery plans

BY ELLIS BOOKER
CW STAFF

CHICAGO — One key lesson trickling from the Great Chicago Flood's aftermath may be that disaster recovery plans need to encompass more than just the data center.

For instance, although Chicago data centers were high, dry and working on auxiliary power, an estimated 80,000 workers were kept away from their blacked-out buildings for most of the week of April 13, resulting in tens of millions of dollars in lost productivity.

Some fast-thinking firms sent small groups of workers armed with laptop computers, cellular phones, fax and even copy machines into rooms at local hotels outside the evacuated downtown district.

A final step was to have Illinois Bell redirect the main switchboard numbers from these businesses to the transplanted departments. Illinois Bell arranged call-forwarding on more than 1,000 lines, including some that were connected to home numbers.

Communication problems

Other firms were less prepared, according to knowledgeable sources who noted that some businesses had trouble communicating with employees about important details — such as whether to report to work.

Still, disaster gurus had advice aplenty for information systems staffs who, having survived the flood, might have been lulled into a false sense of security.

"People need to find out the facts of their building facilities and learn the points of failure," said Eduardo P. Boado, chief executive officer and president of Data Center Design and Development Corp.

"You need to have a disaster recovery plan and a business restoration plan," said Boado, whose Palatine, Ill.-based company designs and builds data centers for the likes of Comdisco Disaster Recovery Services, Inc., the nation's largest provider of backup hot sites.

According to Comdisco Executive Vice President John A. Jackson, the flood resulted in the busiest single week in the company's history.

At its peak, Comdisco had 18 companies with disaster declarations — that is, companies occupying Comdisco hot-site recovery centers around the country — and another 19 companies on alert.

Not surprisingly, Jackson said, the company received an abnormally high number of calls Monday from Chicago-based firms looking for help.

Jackson said a number of the callers had to be turned away in favor of Comdisco customers already under contract.

Meanwhile, an entirely different sort of computer setup helped the U.S. Army Corps of Engineers in its effort to drain the 60 miles of flooded coal tunnels beneath the city's commercial district.

A personal computer-based hydraulic modeling system called Unet, previously developed by one of the corps' engineers, was being used to conduct what-if analyses.

According to Kirk Farah, chief of the Information Management Office for the Corps of Engineers' Chicago District, it was important to model the effect of the pumping operation — which hit highs of 10,000 to 12,000 gallons per minute — on the century-old coal tunnels. Too much water sucked out too quickly could damage the tunnels and add the danger of cave-ins and structural damage to an already difficult recovery operation, he said.

Output loss estimated at $500M

The Chicago flood has drained this city of more than $1.5 billion in damage, ruined store inventory and lost output.

In addition to the estimated $1 billion in property and casualty damages, an economic analysis conducted by the Regional Economics Applications Laboratory (REAL) estimated output losses for the week of April 13 at approximately $500 million.

REAL is jointly run by the University of Illinois at Urbana and the Federal Reserve Bank of Chicago.

"We define 'output' as the total sales of these companies," said Ramamohan Mahidhara, REAL's senior research associate.

Mahidhara pointed out that measuring nonmanufacturing output for service industries and financial companies is much trickier than in manufacturing, where output can be measured in terms of discrete units.

The REAL model works this way:

- Assume that some 250,000 workers evacuated the city's Loop area on Monday, April 13; that most — if not all — were also at home the next day; and that 85,000 workers were idled Wednesday through Friday.
- Calculate total loss by generating output-per-worker estimates and multiplying these (by industry) by the number of idled workers (also by industry).

This method gives a figure of direct loss, for all industries combined, of $285 million for the week of April 13. Indirect losses, according to the model, will add another $199 million to the total during the next several months.

The econometric simulation package from Quantitative Micro Software of Irvine, Calif., was run on an Intel 386-based computer.

Bull beefs up service to woo back users

CONTINUED FROM PAGE 51

spite having no existing Bull hardware — is in the minority, MacKenzie acknowledged. Bull is more likely to coax current customers to use its services, he said, but is still targeting large IBM mainframe sites for consulting on downsizing plans.

However, some users predicted that turning itself into a service provider will be a slow process for Bull. The city of Houston is an avid fan of Bull systems and plans to move to Unix through Bull's products. Nevertheless, Houston's public utilities sector is unsure whether it will use Integris for the integration, said Jim Conner, a systems consultant.

"We have a good relationship with Bull, and we're relieved that new proprietary stuff has come out," Conner said, "but this whole conversion process will be real slow, over several years."

Relief was a word often cited by users talking about Bull's new DPS mainframes. They said Bull's new boxes prove the company's commitment to its proprietary systems while at the same time expanding user access to open systems.

Introducing . . .

Along with padding the proprietary DPS mainframe line with two new series, Bull pegged a debut this month for the first fruits of a 4-month-old pact with IBM: 10 workstations and servers based on the IBM RISC System/6000 models but priced lower and renamed the DPX/20 line [CW, April 13]. The products are the first in an aggressive push of the Distributed Computing Model (DCM), said Maurice Gervais, vice president of the company's North American/Pacific Products & Systems.

The lynchpin of Bull's migration scheme, DCM is a set of standards for making disparate proprietary and Unix-based systems work together. Open Software Foundation (OSF) writes DCM rules. Bull, along with IBM and DEC, among others, belongs to OSF.

Dukane Corp., a St. Charles, Ill.-based electronics company, bought a Unix-based Bull machine last year to complement its existing DPS 7000 box. "We're going more and more to Unix," said Sandra Schuler, systems analyst. "I don't think we'll buy anything else from Bull on [the mainframe] scale, and it's good to know we can support and migrate our current applications."

"IS people are struggling with whether to buy proprietary or Unix equipment. DCM erases that question," MacKenzie said.

Bull plans to work with IBM to make their systems better interoperate, with IBM working to put Distributed Computing Environment pieces on the RS/6000 and Bull's DPX/20.

Too little, too late?

For some longtime Bull customers, Bull's open systems push came too late.

PHH, Inc., a real estate management service and 15-year DPS user in Wilton, Conn., has begun a project to swap out its Bull mainframe in favor of one from Amdahl Corp. The company is 75% done installing a 2,000-node local-area network composed largely of personal computers from Compaq Computer Corp., said Chuck Bender, director of technology services for technical management consulting.

"The IBM-compatible systems just had more application development and other tools available," Bender explained.

Bull officials acknowledged that Bull systems lack a wide range of tools, but they said the company plans to work with third-party software vendors to build Distributed Computing Environment-compatible utilities.

KIM S. NASH

Bull's new systems

The new systems in Bull's stable include the following:

- DPS 7000/400, 500, 700 series mainframes. Eight new models in a line that Bull officials said costs the company $100 million in research and development each year. Target: midlevel mainframe transaction processing sites running GCOS 7-based machines. Availability: May. Base price: $180,000.
- DPS 9000/500 series mainframes. Seven new models that Bull said are equivalent to IBM Enterprise System/9000 mainframes, Models 120 through 440. Target: older DPS 8 or DPS 8000 transaction processing sites. Availability: May. Base price: $360,000.
- DPX/20 workstations and servers. Ten renamed IBM RS/6000s, ranging from single-user workstations to servers for up to 150 users, priced slightly below IBM list. Availability: July. Price: $7,000 to $60,000.

KIM S. NASH

Bank tightens technology belt

CONTINUED FROM PAGE 51

profit in 1991, but 1992 gains in business volume appear to be modest.

"Our challenge is to do more with less, under the circumstances of the economic environment," said Yukio Harada, senior vice president of the California bank's data processing services department. "We are under pressure to reduce cost and to provide more service."

Senior management at the bank sets the tone for IS purchases. "When we see an opportunity to buy new technology that makes sense strategically, we do that," said Gene Galloway, executive vice president of the Los Angeles bank's Retail Marketing Division. "But we don't want to arbitrarily put in a new computer system [just] because there's a new technology out there."

Galloway cited the recent purchase of a personal computer local-area network system for a treasury application as a cost-effective alternative to mainframes and minicomputers.

Getting the edge

Creating new service features in banking systems is an IS priority, Harada said, because these features add a competitive edge to industry-standard banking products.

Among these are new automated teller machine (ATM) screens that are labeled in Chinese and Spanish to attract new customers. Consumers who do their banking through these networked ATMs — even if they deposit their money in competing banks — generate fees to Sanwa Bank California.

The bank also developed a cash management system based on an IBM System/88 computer. It is expected to generate more revenue by investing large sums of money for corporate customers. There has also been some experimentation with non-IBM technologies for new projects, including several Hewlett-Packard Co. HP 9000 Unix machines for a project by the bank's treasury department.

Sanwa Bank California
Los Angeles

- **Challenge:** Reduce costs while providing more service during recessionary times.
- **Strategy:** Make the most of current resources by adding new technologies only where carefully cost justified and use as much packaged software as possible.
- **Results:** New applications include ATM project and cash management systems, although the bank decided to stay with IBM IMS rather than DB2 as its RDBMS.

For the near future, though, Sanwa's IS department will remain conservative in most of its purchases, Harada said. For example, IS managers have considered, but not accepted, IBM's DB2 relational database management system, preferring to stay with tried-and-true IBM IMS. The Monterey Park data center runs its IBM mainframes in an MVS/ESA environment, having converted from MVS/XA two years ago to stay current.

To keep application development costs low and to maintain its programming staff at about 65 people, the bank uses off-the-shelf software to handle general ledger and accounting applications.

"We are a packaged software shop," explained Harada, who came here in 1990 from Sanwa Bank Ltd. posts at Chicago and New York subsidiaries. Some packages are modified to speed customer service and to meet shifting regulatory requirements for banks.

The hardware side of the shop is straightforward, too. There is one IBM 3090 Model 400 E, an IBM Application System/400 and an IBM System/88 fault-tolerant machine. Desktop hardware must be approved by an IS committee, or the end user maintains it.

"If someone wants a PC or a piece of software for their PC, they have to cost-justify it to their management," said John Schafer, operations automation manager. Approved items include Compaq Computer Corp. PCs and Novell, Inc. LANs, he said.

Booming business will promote technology change at the bank, and there are signs that business is picking up.

"We have ATM usage that pushes through 20 million transactions per month," said James Cordle, senior vice president of operations services. Continued high transaction levels will soon force the bank to move to real-time posting of deposits and withdrawals, he added.

Sanwa Bank California plans more high-tech innovations when the U.S. recession lifts. But for now, Harada said, it will be pay-as-you-go at the Monterey Park data center.

"We go with proven technology, and we try to be efficient always," Harada said. "The group managers have to spend money with the mind-set that they are the owners of the bank."

RAID subsystem for IBM AS/400 debuts

BY ELLIS BOOKER
CW STAFF

ROSEMONT, Ill. — Accompanied by a snazzy laser light show, Hinsdale, Ill.-based XL/Datacomp, Inc. recently unveiled what is believed to be the industry's first redundant arrays of inexpensive disks (RAID) storage subsystem for the IBM Application System/400.

The Alpine 9600 Storage Manager slides into place behind the Iceberg 9200, a disk array subsystem for IBM mainframes that Louisville, Colo.-based Storage Technology Corp. introduced in January. Storage Tek acquired XL/Datacomp last November.

The $200,000 to $500,000 Alpine, which XL/Datacomp claims is fully compatible with IBM's own 9336 storage subsystem, provides data capacities of 10G to 25G bytes.

The product is scheduled to begin shipping in the third quarter.

A key feature of Alpine is its ability to provide users with fault tolerance through use of redundant components and RAID 5-level architecture. XL/Datacomp called Alpine the first in a series of high-availability products known as the OnLine Plus family.

One OnLine Plus feature is Alpine's use of customer-replaceable components that are designed to be removed and replaced without interrupting user access to data.

The system also uses two reduced instruction set computing processors to handle the intelligent features for Alpine, such as logical data mapping, which spreads data across multiple physical disks. This is intended to speed recovery in case one disk fails.

NEW PRODUCTS

Utilities

Software Engineering of America, Inc. has announced Release 4.3 of Pdsfast, its mainframe data set management tool.

According to the company, Pdsfast decreases elapsed time for direct-access storage device management functions by as much as 90%. The new version adds support for IBM's Escon architecture.

Pricing ranges from $13,500 to $42,300.

Software Engineering of America
2001 Marcus Ave.
Lake Success, N.Y. 11042
(516) 328-7000

Picture/Utilities has announced Picture/Midrange Release 2.1 for the IBM Application System/400 platform.

Picture/Midrange provides access to current information on all devices attached to the AS/400, including local and remote systems and peripherals.

The utility produces logical diagrams, summaries and detailed configuration reports. Included in the package is the Subsystem Analyzer, which logically describes all AS/400 subsystems.

The product costs $495. Free 30-day trials are offered.

Picture/Utilities
P.O. Box 141077
Dallas, Texas 75214
(214) 960-5742

BMC Software, Inc. has announced the availability of Database Integrity Plus (DI+).

DI+ handles IMS control block mismatches, preventing database and system outages, the company said. It provides analysis and system administration tools in addition to protecting IMS data integrity.

Tiered pricing for a perpetual license starts at $11,500.

BMC Software
Box 2002
1 Sugar Creek Center Blvd.
Sugar Land, Texas 77487
(713) 240-8800

Databasics, Inc. has announced System Executive for the IBM Application System/400.

System Executive is a system management tool that controls menus and library lists and provides security features. Pricing starts at $850.

The company also announced Name and Address, a general-purpose field validation utility.

Databasics
720 Thousand Oaks
Hurst, Texas 76054
(817) 268-4014

Data storage

Unisys Corp. has designed a 5¼-in. Small Computer Systems Interface-compatible disk subsystem.

The Unity Storage Rack Module 9600-15 can be used as an external subsystem or as an internal system in Unisys A and V series mainframes. Each rack module can hold up to four 780M-byte drives.

Entry-level pricing is approximately $10 per megabyte, the company said.

Unisys has also announced new rack-mount cabinets for mainframe data storage. The USE1900 and USE3600 are available now.

Unisys
Box 500
Blue Bell, Pa. 19424
(215) 542-2239

Applications packages

Axis Computer Systems, Inc. has created Axiom/MX, a software solution for nonassembly manufacturing firms.

The company described nonassembly manufacturing work flow as using both discrete and process elements. Axiom/MX provides manufacturing and resource planning capabilities plus additional functionality in material dispatching, built-in quantity/tolerance controls, group technology scheduling and standard costing.

The product is available on Digital Equipment Corp. VMS, Ultrix and Unix systems. Pricing ranges from $50,000 to $300,000, depending on the number of users and sites.

Axis Computer Systems
65 Boston Post Road
Marlboro, Mass. 01752
(508) 481-9600

Information Consultants, Inc. has announced the Financial Portrait Software System reporting package for the IBM Application System/400 platform.

The product supports general ledger, financial reporting, accounts payable and accounts receivable applications. It handles multiple companies, up to six open periods for posting, user-defined data types and currencies, recurring entries, automatic check writing from multiple banks and automatic transaction interfaces.

Pricing starts at $21,000.

Information Consultants
Suite 2T
1326 E. Algonquin Road
Schaumburg, Ill. 60173
(708) 397-0088

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The computer that mad

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But what hasn't changed about IBM research is the value of a person like John Cocke, who is one of 58 IBM Fellows. It's a title he earned by having great ideas, and it gives him the one thing he treasures most. Complete freedom to have more of them.

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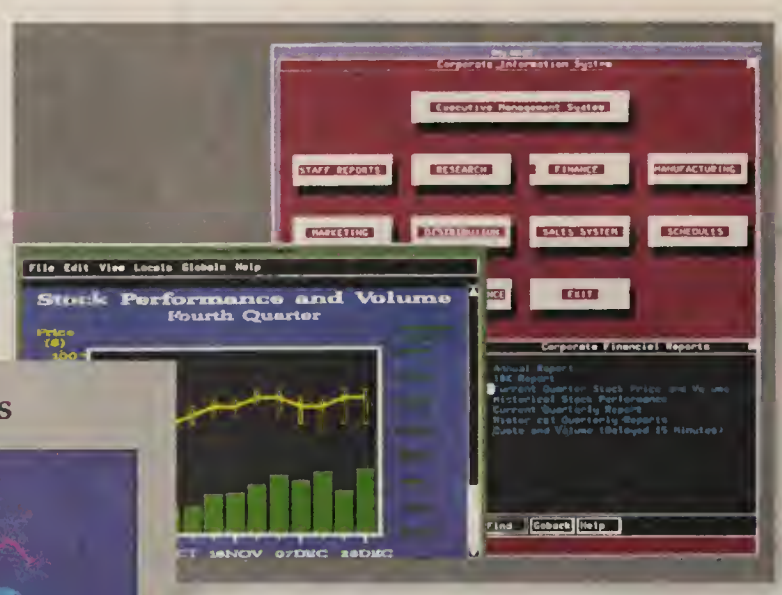
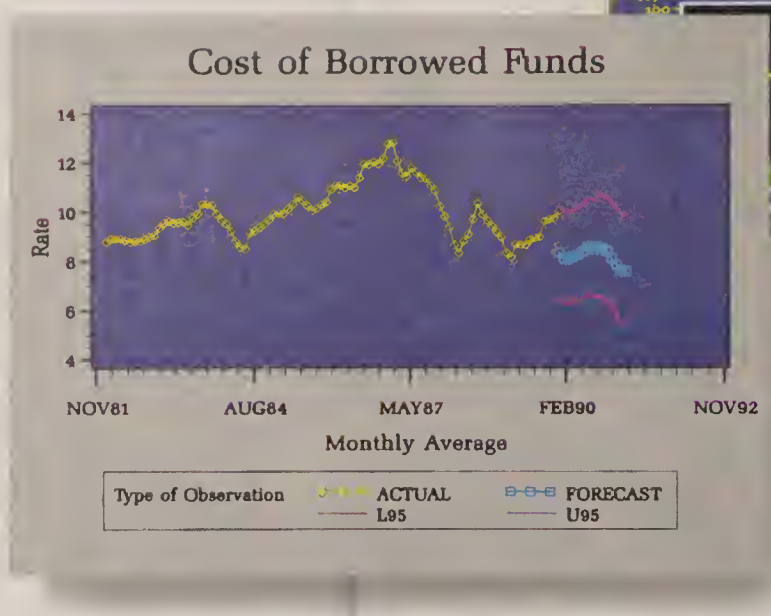


Finance



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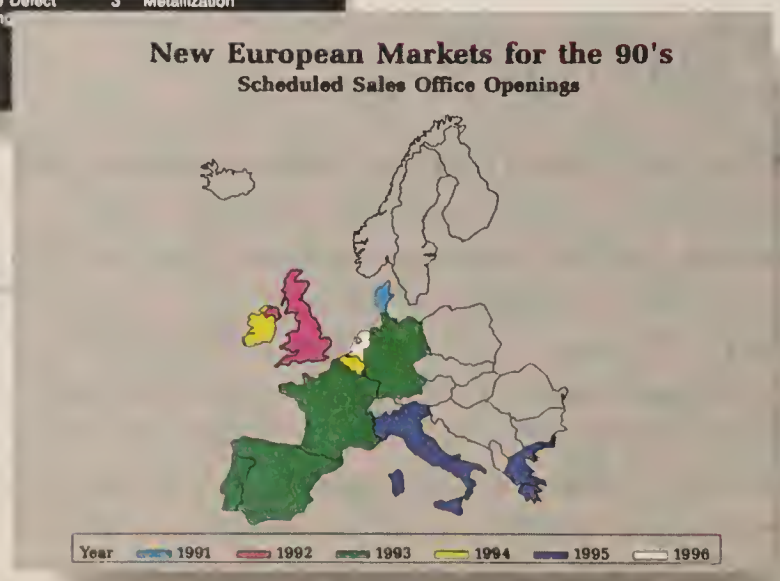

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Informix ports RDBMS, tools to NetWare

BY JEAN S. BOZMAN
and JIM NASH
CW STAFF

MENLO PARK, Calif. — Informix Software, Inc. is in the process of porting its Informix 5.0 relational database and development tools over to Novell, Inc.'s NetWare.

The products are already in beta testing and will be formally announced by next month, said Phil White, Informix's chief executive officer.

Informix's support for NetWare follows already available NetWare-compatible versions of Oracle Corp.'s Oracle 6.0 relational database management system and another database made by Gupta Technologies, Inc.

Informix-4GL application development tools will be packaged with Informix's database so users can blend their Unix and NetWare client/server applications, White said. "We think customers will want to have common databases and tools" between the two environments, he added.

Branching out

Novell is refocusing its database division to work with as many independent RDBMS vendors as possible.

"Until six weeks ago, we were very focused on our own relational database, NetWare SQL," said Robert Shoop, director of Novell's database products division in Austin, Texas. "Now, the charter of our division is much broader in terms of trying to work with all database vendors."

Shoop said Novell would encourage independent database vendors to port their products to run under NetWare in a native mode, but he did not rule out the possibility of NetWare local-area networks hosting Unix-based database servers.

In any case, the database server would not have to reside on the NetWare server that runs the LAN. "We will provide a runtime version of the NetWare kernel to run on a separate box that is dedicated to be a database server," Shoop explained.

Novell has announced plans to expand its Unix offerings through Unix connectivity products and through a small spin-off Unix company that will be called Univell.

Peer-to-peer tool premature for users

BY GARRY RAY
CW STAFF

A San Francisco-based software company may be pushing the envelope of client/server technology, but early users are foregoing technology leaps in favor of their own information systems strategies.

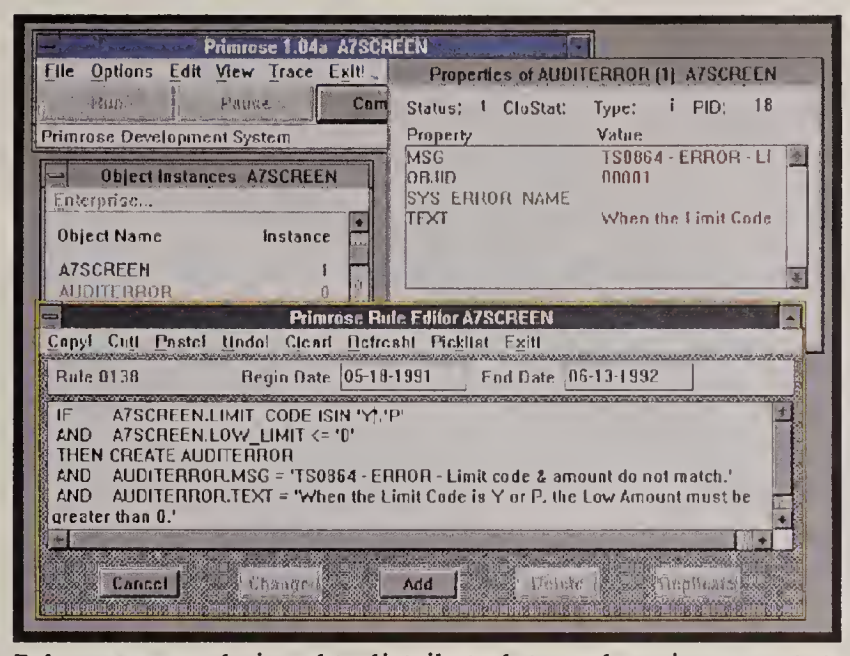
Tesseract Corp., a provider of human resources management applications, recently announced Primrose, a personal computer-based development tool that supports peer-to-peer multiprocessing in enterprise environments.

Currently running on OS/2 clients and servers and planned for other platforms, Primrose distributes data and service requests to systems residing on a network, including PCs and mainframes, said Dan Easterlin, director of advanced software marketing at the company. Primrose applications, he said, can access data stored in IBM DB2 databases or in the Database Manager of IBM's OS/2 Extended Edition.

Waiting to leap

But early users, such as San Francisco-based Chevron Corp., are not prepared to jump into peer-to-peer processing. "We don't know what we're going to do with it," said Jay Stright, manager of employee systems at the company. "We have to rethink our processes before we can fully use" the technology.

Instead, Chevron and other companies are using the Primrose development environment to create more traditional, client/server applications, such as those where clients issue SQL requests to only a single server.



Primrose *was designed to distribute data and service requests to peers throughout a network*

With the graphical user interface tools provided with the product, Stright's team has developed a human resources management system that allows users to match Chevron's 360,000 employee records with positions that are available in the company. "We're giving data to management before they make decisions, rather than retroactively," Stright said.

Such an application had previously been impractical because of the company's reliance on Information Builders, Inc.'s Focus 4GL.

Other human resources applications "had to be centralized because we couldn't have people mucking around in the [Focus] code." Information Builders announced a graphical development tool, PM Focus, at last month's Comdex/Spring '92.

In Toronto, the Canadian Imperial Bank of Commerce has used Primrose to implement a "competency modeling" application that rates individual employees against a skills profile, according to Ned Mikloska, the bank's manager of human resources management systems.

In the future, he said, all company employees will have access to job postings that will rate the employee's suitability for a posted position and recommend additional training, if required. "We couldn't do this using a host-based solution because of the graphical environment. And we couldn't deliver it to 50,000 users over a LAN," Mikloska said.

Looking ahead

Despite the hesitation of Primrose users to implement the tool's embedded peer-to-peer technology, analysts said it has significant potential. In a report released in March, Southport, Conn.-based New Science Associates, Inc. called the underlying Primrose technology "ahead of its time."

Yet senior research analyst John E. Girard, author of the report, said last week, "Tesseract will have a challenge educating people to use the tool for maximum efficiencies."

"They say you have to crawl before you can walk," Stright said. "We're in the aggressive crawling stage right now."

Future versions scheduled for delivery in the fourth quarter will supply DOS-based PCs with the ability to act as servers and Microsoft Corp. Windows-based PCs with full peer support, according to the company.

Implementations for IBM's AIX version of Unix and IBM MVS will also be available by the end of the year, the company said.

MSP fills gap as users await IBM's Repository Manager

BY JOHANNA AMBROSIO
CW STAFF

While waiting for IBM to deliver a working version of its Repository Manager, some customers have found alternatives. One of these is a package from Manager Software Products, Inc. (MSP) in Lexington, Mass.

MSP, whose corporate parent is based in London, reported $27 million in worldwide revenue last year — 30% from the U.S. and Canada. MSP started its U.S. operation in 1977 and claims 300 customers here.

The company has two major products: Methodmanager and Datamanager. The latter was introduced in 1975 and is essentially a dictionary. Methodmanager, introduced in November 1990, builds on Datamanager and adds a user-friendly front end and tool integration. Some 180 sites worldwide use Methodmanager, according to Graham Thompson, MSP's national sales manager.

Marketing focus

As a small company standing in the shadow of IBM, MSP is being extremely careful about how it positions Methodmanager. "It is an interim solution toward Repository Manager," said Michael Dexter-Smith, MSP's chief operating officer. "When IBM comes out, we will unload our dictionary to work with theirs, and we will move into becoming a pure tools company."

"This is not an attempt to compete head-to-head. We can migrate our models into IBM's Repository Manager when it becomes available," Thompson said.

Until IBM's product is commercially available, MSP will gladly sell its version to customers. One of these customers, Travelers Insurance Co. in Hartford, Conn., also sees the MSP package as a stepping-stone to IBM's Repository Manager.

"We were looking for a short-term solution because we figured it would be four to five years before Repository Manager became a viable product," said Art Files, Travelers' director of information resource management. "Now it will have to do us another two to three years."

Travelers is actually using Datamanager, to which the firm added its own front end and integration hooks. "We converted off IBM's data dictionary six years ago. This is an excellent product, and it gives Repository a run for its money," Files said.

The only significant complaint Travelers has, Files said, is about MSP's support, which he said "has its problems. Their responsiveness to our questions could be improved."

Val Szarota, a systems analyst at Hudson's Bay Co. in Toronto, agreed but said support is "getting better, particularly in the past three months."

Hudson's Bay has been using Methodmanager since May 1991 to support its applications development life cycle. He said that one of the things he particularly likes about the product is its ability to be tailored, a trait not shared by some competitors.

MSP is not toeing the IBM line on all matters, however. Although Methodmanager allows users to read and access DB2 files and tables, the product adheres to its own proprietary database when it stores its files.

Thompson said that decision was made for performance and other reasons and that the company has no plans to alter it. Szarota added that the proprietary database has not presented a problem.

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IN BRIEF

TI, Tandem strike CASE deal

■ **Texas Instruments, Inc.** and **Tandem Computers, Inc.** recently agreed to provide TI's Information Engineering Facility (IEF) on Tandem NonStop fault-tolerant systems. Dallas-based TI expects the agreement to speed development of on-line transaction processing applications for IEF users, while Cupertino, Calif.-based Tandem said the deal provides an open application development environment for NonStop users.

■ **Axiom Information Consulting, Inc.** in San Francisco has announced the availability of its Customer System/2, a computer-aided software engineering design guide that works in conjunction with the Application Development Workbench from KnowledgeWare, Inc. The design guide was developed by Axiom with three public utility companies — Puget Sound Power & Light Co., Portland General Electric Co. and Alberta Power Ltd. — to implement a customer information system on which the three utilities are sharing the technology.

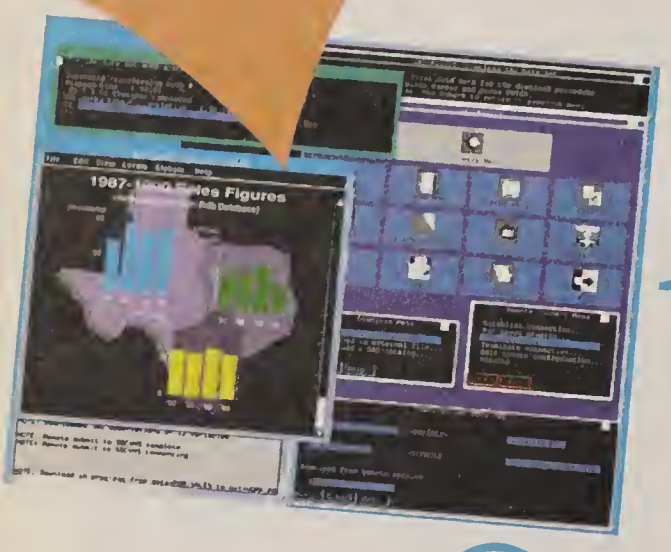
■ **Software Architecture & Engineering, Inc.**, a Herndon, Va., software engineering company, has changed its named to Template Software, Inc. The company promotes the development of applications through the utilization of reusable software elements.

■ **Verdix Corp.**, also based in Herndon, was recently picked to provide software development tools for the Strategic Defense Initiative Brilliant Pebbles Program. Verdix will work with primary contractor Martin Marietta Defense Space & Communications Co. and subcontractor IBM Federal Systems in developing Ada software on radiation-hardened IBM RISC System/6000 platforms.

■ Palo Alto, Calif.-based **Reasoning Systems** announced Refine/C, a customizable re-engineering tool for programs written in C. The $3,500 product produces reports that can be browsed on-line via X Window Systems or printed with a PostScript printer. Refine/C is available for Unix-based systems from Sun Microsystems, Inc. and IBM.

■ Boulder, Colo.-based **MetaCard Corp.** will begin shipping in June MetaCard 1.0, a HyperCard-like development tool for Unix/X11 platforms. It features an array of tools, including text editing, searching and others similar to Apple Computer, Inc.'s HyperCard. It is intended to allow end users and developers to generate applications, Help systems and on-line documentation. MetaCard supports Motif user interface techniques and controls. Applications can be ported across SPARC, Sun 3, DECstation, and SCO Open Desktop systems.

■ Mountain View, Calif. workstation vendor **Silicon Graphics, Inc.** has announced Iris Inventor, an object-oriented, three-dimensional tool kit that will allow developers to quickly generate applications including three-dimensional graphics. Said to be independent of any windowing system, operating system or rendering library, Iris Inventor will also support data exchange between applications with its Inventor File Format. The tool set will be made available for the company's Iris 4-D workstations this summer.



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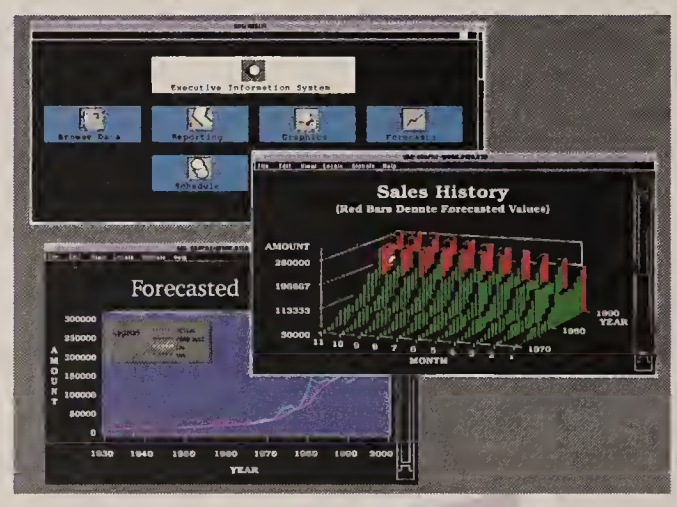

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Digital NEWS 50 — A Top-Ranking Company in the DEC Marketplace

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NEW PRODUCTS

Compilers

Lahey Computer Systems, Inc. has updated its F77L-EM/32 Fortran Language System for personal computers.

Version 5.0 is bundled with a customized version of Phar Lap Software, Inc.'s 386/DOS Extender software. The Extender allows developers to work in a DOS box under Microsoft Corp.'s Windows environment. It also supports applications up to 4G bytes in size. The product also includes an upgraded Source On-Line Debugger, a 32-bit protected-mode debugger.

The F77L-EM/32 system is priced at $1,195.

Lahey Computer Systems
865 Tahoe Blvd.
Incline Village, Nev. 89450
(702) 831-2500

Development tools

Software AG of North America, Inc. has introduced Version 2.2 of Natural, its fourth-generation language.

The new release is compliant with IBM's Common User Access interface standard. It supports IBM CICS 3.2 and databases from IBM, Digital Equipment Corp. and Oracle Corp., among others.

The overall integration of the development environment has also been improved, the company reported.

Pricing ranges from $16,100 to $196,300, depending on the processor group.

Software AG of North America
11190 Sunrise Valley Drive
Reston, Va. 22091
(703) 860-5050

Gold Hill, Inc. has started shipping Golden Common LISP Developer 4.2, including support for the Common LISP Object System (CLOS) object-oriented programming environment.

In addition to CLOS support, Version 4.2 features an improved memory management system, reduced memory requirements and an on-line hypertext Help system. It also offers new loop macro functions for improved handling of iterative procedures, the company reported.

A personal computer license costs $1,995.

Gold Hill
26 Landsdowne St.
Cambridge, Mass. 02139
(617) 621-3300

ProtoView Development Co. has announced ProtoGen 2.1 for the Microsoft Foundation Classes, a code generation tool for use with Microsoft Corp.'s C/C++ 7.0 compiler.

Features include live application test mode, code regeneration facilities and custom controls. The new version generates code for Microsoft's Foundation Class Windows library and the Windows Multiple Document Interface.

The list price is $199. An introductory price of $49.95 is currently offered.

ProtoView Development
353 Georges Road
Dayton, N.J. 08810
(908) 329-8588

Inmark Development Corp. has announced Zapp for DOS.

The Zapp for DOS application development framework is bundled with Zapp for Microsoft Corp. Windows, which allows users to switch programs from one environment to the other by recompiling. Zapp includes data entry forms, automatic resizing of objects based on display size, message handling and transparent Multiple Document Interface support for DOS text mode.

The product supports C++ compilers from Borland International, Inc., Microsoft and Symantec Corp.

The price is $495.

Inmark Development
2065 Landings Drive
Mountain View, Calif. 94043
(415) 691-9000

Lucid, Inc. has announced the availability of the Energize Programming System.

The product provides a central server that connects common Unix application development tools with a new set of advanced programming tools. Energize features incremental compiling of C language and C++ code, linking at the function and class levels and centralized control over tools and data integrity.

The system runs on Sun Microsystems, Inc. SPARCstations and compatible workstations. It supports client/server architectures.

Pricing is $3,250 per seat for 5-user workgroups, and $2,975 per seat for 10-user workgroups. A single license costs $4,250.

Lucid
707 Laurel St.
Menlo Park, Calif. 94025
(415) 329-8400

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Today EMC's Harmonix Series of Integrated Cached Disk Arrays (ICDA™) dramatically advances every standard by which AS/400 DASD is measured.

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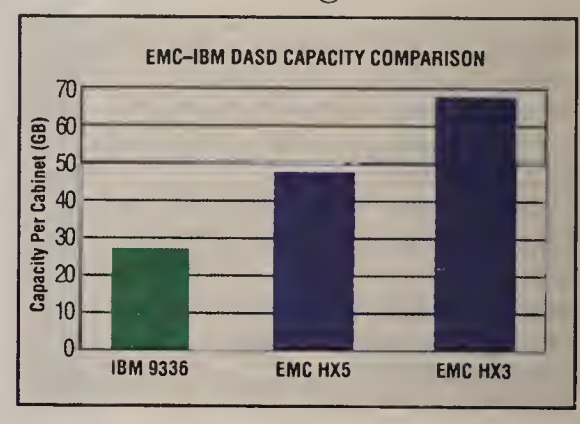

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EMC²
The Storage Architects

The Unix server: There's no single prototype

Is it a downsizing platform? A multiuser host? A LAN upgrade. . . ?

Andy Levine

BY ALAN RADDING

Just wait. Before long, someone's going to proclaim this year as "The Year of the Unix Server." But although it's true that many people are either talking about moving to this increasingly popular platform or simply doing it, it's important to realize that a Unix server isn't a Unix server isn't a Unix server. Consider the following scenarios:

SMITHWAY

Smithway Motor Xpress, Inc. in Fort Dade, Iowa, recently purchased a Unix server. The trucking company wanted a lower cost host for its terminal-based applications, which include company payables, receivables and payroll.

So it replaced two small minicomputers from Digital Equipment Corp. with an IBM RISC System/6000 Model 530 that serves 40 terminal-based end users.

The end users are much happier with their nearly instantaneous response time. Plus, the RS/6000 has more capacity at half the cost of the minicomputer, says Tim Wheeler, MIS director at the firm.

TEXTRON

When Textron Financial Corp. in Providence, R.I., decided to upgrade the terminal-based inventory financing application in its floor plan division, information systems managers there rejected the idea of a simple face-lift. Instead, they went full client/server, replacing the VSAM-based CICS system with a personal computer local-area network and Unix server — a Sun Microsystems, Inc. SPARCstation, to be exact. Now a network of 50 PCs works through the SPARCstation to perform on-line transaction processing and ad hoc querying against the DB2 database running on an IBM mainframe.

The $150 million division debated between OS/2 or Unix; Unix won when it outperformed OS/2 in accessing the large DB2 database. Now the company is planning to roll out a similar system to all six of its business divisions.

COMPUCHECK

The constraints of DOS were what propelled a move to Unix at Austin, Texas-based CompuCheck Travel Management Services, Inc., a division of the Carlson Travel Network. The company's network of 30 PCs was outgrowing its Compaq Computer Corp. 386-based server. "We had to go to a 486 or another architecture," says George Fawcett, director of development.

Fawcett fought the OS/2 vs. Unix battle as well, but "in the long run, the variety of machines and the horsepower on Unix was far better," he says. The Data General Corp. two-processor Aviion machine is CompuCheck's new database server.

The system went on-line in mid-December. By February, CompuCheck was handling 50% more volume "without a hiccup," Fawcett says. By the end of the year, he says he expects the system to handle twice the volume it handled a year earlier.

All three companies — and thousands of others — bought what are commonly know as Unix servers. All three are happy with the results, which include lower costs, faster performance and better room for growth.

But all three have very different computer architectures and different needs.

The fact of the matter is, a "Unix server" can be a number of different things, depending on how it's used. Most companies use servers in the following ways:

- As the middle layer in a three-tiered client/server-like architecture that includes a PC LAN, the Unix server and a mainframe, as in Textron's case.
- As a substitute for a proprietary mainframe or minicomputer in a multiuser, terminal-based architecture, as in Smithway's case.
- As an upgrade from a PC server that has been serving on a PC LAN, as in CompuCheck's case.

In addition, there are four server types — a basic file server, an application server (as used by Smithway), a database server (as in Textron's and CompuCheck's case) and a compute server (see story page 67).

With just about any Unix machine qualifying as some sort of server, it's little wonder that vendors are scrambling for a place in the market, which is estimated at $3.5 billion for reduced instruction set computing-based multiuser Unix machines alone, according to a recent Aberdeen Group report. Currently, Hewlett-Packard Co. is the market share commander at 48.6%, with IBM following at 17.1% and Sun in third at 7.1%.

Amid the haziness and frenzied activity in this market, you still need to choose a machine, the requirements of which change dramatically depending on how you're planning to use it.

Continued on page 65

Radding is a free-lance writer based in Newton, Mass.

INSIDE

Every year at COMDEX, one product is recognized as more advanced than any other, and named Best of Show.

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BEST OF COMDEX Spring '92 BYTE

Winner

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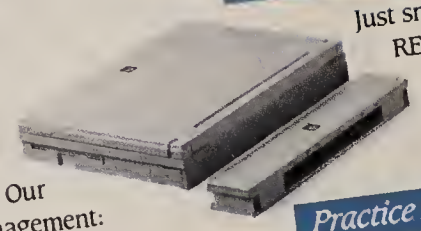

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There's no single prototype

CONTINUED FROM PAGE 63

Generally, system managers evaluate Unix servers according to the following four selection criteria:

- Hardware configuration, processor and price/performance.
- The vendor's Unix implementation.
- The performance of compatible relational database management systems.
- The degree to which independent software vendors support the Unix platform with applications and tools.

But the way to analyze those requirements depends on how you intend to use the machine. The least common scenario is the Textron case. Many people are talking about Unix servers on client/server-based PC networks, but "commercial Unix servers are still used predominantly as hosts for terminal-based applications," says Tom Willmott, vice president at Boston-based Aberdeen Group.

Even in HP's best-selling Unix server line — the 9000 series — 90% to 95% of the machines sold are used as hosts to directly connected terminals.

In primarily terminal-based architectures, you need to determine how much capacity and performance you need. The higher your terminal-to-PC ratio, the stronger your integer performance should be, since the server will take on more of the processing. In terms of memory and storage, consultants recommend a minimum of 48M to 60M bytes of the former and 1G to 2G bytes of the latter. To obtain that, look toward the midrange and high end of vendors' server lines, most likely tower (deskside) or full-cabinet (rack-mount) systems rather than the entry-level desktop style.

Room for the PC

The terminal server should also have slots to accommodate cards for directly attached and LAN-attached terminals or PCs. Typically, you can expect a minimum of 10 to 12 slots on most vendors' high-end machines, although some vendors, such as DG, range up to 20 slots.

The server should also support transaction processing with a robust RBDMS and a transaction monitor, such as Tuxedo from Unix System Laboratories, Inc. or Transarc Corp.'s Encina.

If your applications are mission-critical or are oriented toward transaction processing or on-line customer service, you will be interested in "high-availability" features, which almost every vendor has started to offer to compete with specialized fault-tolerant servers. High-availability differs from fault tolerance in that it merely allows the system to recover quickly from a failure.

High-availability features, found only in the larger deskside and rack-mount configurations, include disk mirroring, redundant arrays of inexpensive disks, error-checking and correcting memory, redundant power supplies and the ability to replace disk drives while the machine is running.

Multiprocessing power

Another area in which vendors are struggling to differentiate themselves is multiprocessing. If your applications demand heavy querying of a relational database by multiple users or on-line transaction processing, you may want to consider machines that allow you to upgrade to a multiprocessing model.

There is more to multiprocessing than adding CPUs. The true benefits are seen in *symmetric* multiprocessing, where compute and I/O tasks run in parallel, and each CPU has equal access to common shared memory. Since the core Unix kernel code — such as Unix System V — has been slow to support full symmetric multiprocessing, vendors have had to add proprietary extensions to the kernel.

IBM, whose RS/6000 line consists only of single processors, takes a different tack. It is working on an architecture that would connect RS/6000s on a high-speed backbone, allowing each machine to be an individual processor on a giant "massively parallel" machine.

Finally, you also need to find out which vertical-industry applications are available. HP and Sun currently enjoy the broadest support from independent software developers, and IBM and DEC have vast libraries of proprietary software, much of which is being ported to Unix.

In many cases, you'll need to convert your current applications to Unix, and the ease of doing that can vary from machine to machine. Porting proprietary applications to the Unix environment requires a major rewrite and should be undertaken by the developer.

Client/server setups

While Unix multiuser machines are currently more apt to be playing a terminal-to-host than server-to-client role, the client/server market has just begun. Of 800 firms interested in downsizing surveyed recently by Forrester Research, Inc. in Cambridge, Mass., 51% opted for a LAN-based platform, while 18% chose midrange multiuser systems.

For organizations making a move to a client/server environment, the biggest concern (before getting into the requirements listed above) is the degree to which the server can support popular networking technologies, a robust RDBMS and software development tools, such as the various SQL tools, access products and databases.

The RDBMS decision is often intertwined with which version of Unix to settle on. Such was the case at Textron. "To us, Unix is just another platform," says Paul Hamel, vice president of systems and corporate planning at Textron.

Continued on page 67

The lineup

The differences among Unix vendors are often less a matter of hardware and CPU than software performance, packaging, pricing, configuration and support. Here's how some of the leading vendors stack up:

IBM
Strengths: Floating-point performance; large amounts of memory and storage (512M and 53G bytes, respectively, at the high end); worldwide support and service.
Weaknesses: No multiprocessing; no stated direction for its Unix implementation (AIX).

HP
Strengths: Commercially oriented Unix version (HP/UX) and Unix compiler; strong third-party software support; broad line of servers; excellent processor performance.
Weaknesses: Slow to enter multiprocessing (late '91); expandable only to 12 slots at the high-end.

Sun
Strengths: Strong third-party software support; aggressive push into multiprocessing; advanced Unix operating system implementation (Solaris).
Weaknesses: Desktop orientation; aging Scalable Processor Architecture technology; new to multiprocessing (late '91).

DEC
Strengths: OSF/1 Unix implementation; strong support for networking and distributed processing; client/server computing.
Weaknesses: Current reliance on Mips Computer Systems, Inc. for Unix processors; lack of clear direction while waiting for Alpha.

DG
Strengths: Robust multiprocessing; 20 expansion slots at high end.
Weaknesses: Lack of strong complementary Unix workstations; reliance on the Motorola, Inc. processor, which is not slated for advanced development.

Beyond MIPS and SPECmarks

Forget millions of instructions per second (MIPS) ratings. When evaluating Unix servers, system managers need a new set of performance measurements.

"MIPS don't mean anything, and SPECmarks are really measurements for technical workstations," says Tom Willmott, vice president at Aberdeen Group. It's possible to use floating-point or integer SPECmarks to estimate a machine's compute or application serving potential, but even that won't tell you much.

Instead, system managers are turning to two sets of measurements: the Transaction Processing Counsel's (TPC) TPC-A and B benchmarks and the Aim ratings from Aim Technology.

TPC-A measures how many transactions per second a system can perform in an on-line transaction processing environment. TPC-B focuses on batch-type database transaction processing performance.

While the TPC offers guidelines for how the benchmark tests should be administered and reported, analysts do not consider the results definitive. At best, the tests approximate a machine's inherent transaction processing capabilities.

Aim ratings probe more into the details of a Unix system's performance by using a multitasking test that exercises all aspects of the system. The key Aim ratings for servers are "System Throughput Graph" and "Sustained Performance."

In Aim's winter 1991-92 ratings, DG's Aviion 4320 achieved best sustained performance in the under-$50,000 class (see chart). Sustained performance is measured in terms of maximum user workload, or the point at which performance becomes unacceptable.

System throughput is measured in terms of jobs per minute. In Aim's recent tests, the DG Aviion 4320 was again a winner, achieving a near maximum throughput of 350 job/min. until 236 user loads. The IBM RS/6000 PowerServer 530H scored about 265 job/min. until 156 user loads.

The HP 9000 Model 750 achieved a steady 450 job/min. until 278 user loads.

ALAN RADDING

Sustained performance leaders

The following systems maintained the highest performance under heavy user loads

Source: Aim Technology

CW Chart: Marie Haines

Don't allow downsizing to shrink service and support

BY JOHN KAFALAS

If you're considering downsizing to a Unix server, you may be concerned about an accompanying diminishment in service and support.

The good news is that most users say they are pretty satisfied with the level of service and support they receive from their Unix system vendors. Although "some of the major [Unix] players don't have the resources" to support a widely dispersed installed base, most of those vendors have augmented their own services by taking on third-party providers, says Rikki Kirzner, a senior industry analyst at market research firm Dataquest, Inc. in San Jose, Calif.

Third-party service allows vendors such as **Sun Microsystems, Inc.** to decrease the amount of time it takes to respond to customer calls and also cover a wider geographical area.

The other piece of good news is cost savings with a downsized platform. "Customers talk about spending millions of dollars a year with IBM, compared to tens of thousands of dollars with a Unix system," Kirzner says. Of course, these savings have to be balanced against the initial investment: primarily hardware, software and training.

One reason for the lower costs is that most companies assume some of the service functions themselves and use field engineers rather than having on-site service personnel.

Wayne Krauth, systems administrator and hardware engineer at Delorme Mapping, Inc. in Freeport, Maine, says that although his company has a fairly large network of Unix workstations and personal computers, it has a support contract for software only. Hardware "maintenance costs are my salary," he says.

Downtime a downer

Trouble looms, though, as vendors make deeper inroads into larger firms such as banks, insurance companies and airlines, which have a low tolerance for downtime.

"As we get into larger, mission-critical applications, [customers'] standards are so high that if you don't provide good support, you're simply not a player. And when you get thrown out, you're never going to go back," says Jack Eaton, a senior sales representative at Sun.

While Sun uses third parties to augment its service, **Hewlett-Packard Co.** and **Digital Equipment Corp.** are highly regarded for the maintenance they offer on their own.

One company we spoke with uses **IBM** as a single point of contact for a worldwide network that uses Unix systems from nearly a dozen vendors. The company relies on IBM to solve interoperability problems and to service all of its systems, regardless of vendor.

Quality of service can differ regionally, says Jeffrey Kaplan, director at Dataquest/Ledgeway in Framingham, Mass. "How well the vendor and the service provider perform within your own geographic area and industry segment" can differ widely from area to area and from industry to industry, he says.

When dealing with a third-party service company, it's important to make sure it has the necessary microcode licenses to enable it to run diagnostics on the system. It's also beneficial to find out if the service company will be sending the same field engineer or engineers on each service call so that they'll become familiar with the customer's equipment configuration.

Software support is another key area. Kaplan recommends looking for toll-free support hot lines, call-tracking systems and bulletin boards. Also check into what the vendor can offer in terms of application development. Some of the larger vendors have consulting groups that you can hire to rewrite mainframe applications for Unix systems.

Creative answers

Most vendors have begun to offer innovative ways to answer commonly asked questions. For instance, Sun offers AnswerBook, a compact disc/read-only memory-based documentation package.

As part of its support package, HP offers Support Watch system-monitoring software, which logs hardware errors (disk I/O and soft memory errors) as well as both hardware and software configuration changes. It can be set up to call an HP response center automatically or alert a system administrator. HP also has Support Line, an on-line system into which users can dial and post questions, search a problem/solution database or download patches to fix bugs.

In most cases, vendors are willing to bend their policies to suit the requirements of individual sites. •

Kafalas is a free-lance writer based in Hudson, Mass.

Service center

Ask the following questions to get the service and support you need

HARDWARE

- **What is the guaranteed response time?** Typical choices are two-hour, four-hour and next-day response.
- **Does the local service depot keep all spare parts in stock?** In some cases, the vendor will keep a lockbox containing spare parts on-site.
- **Will the field engineer be familiar with my system configuration?** Generally, vendors account-assign field engineers.

SOFTWARE

- **Does the vendor have an application development consulting group?** Size and scope can vary considerably.
- **Does the provider offer an 800 number for support?**
- **Are on-line services (e.g. bulletin boards, electronic updates and software bug-fix patches) available?**

More CPU? Up the throughput? Servers are accommodating

There are all kinds of servers, even within a vendor's product lineup. The machine can be as basic as a small Unix workstation minus the graphics card and monitor and selling for less than $10,000, or it can be a large multiprocessor model with tens of megabytes of memory and gigabytes of mirrored disk storage that is capable of supporting hundreds of users at a cost of several hundred thousand dollars.

At this desktop level, Unix servers are not significantly different from Unix workstations, except they often cost less. These low-end servers are most often used for simple file and device sharing but not for application and database serving.

"You can get away with a desktop workstation as a server if you don't need a lot of expandability," says Stephen Widen, senior analyst at Workgroup Technologies, Inc. in Hampton, N.H.

It's not until the $50,000 point that vendors really begin to differentiate their servers from workstations.

"You'll start seeing greater I/O, more throughput, more disks supported and more memory, but the CPU will look exactly the same," says John Morrell, senior analyst/Unix market at International Data Corp. in Framingham, Mass. Vendors will also introduce multiprocessing as "a cheap way [for them] to increase power," he notes.

At the high end of the market, starting at about $100,000, Unix servers are loaded with industrial-strength, high-availability features that allow the machine to function much like the proprietary minicomputers they often replace. •

ALAN RADDING

Typecast

Of the four types of Unix servers, each has its own requirements, according to Robert Kidd, senior industry analyst at Dataquest in San Jose, Calif.

SERVER	REQUIREMENTS
• **Basic file server**	Large amounts of fast storage and a fast I/O bus.
• **Application server**	Strong integer processing performance and large amounts of memory.
• **Database server**	Robust RDBMS and strong transaction processing performance along with high-availability features.
• **Compute server**	Very high floating-point processing performance.

Source: Dataquest, Inc. CW Chart: Marie Haines

There's no single prototype

CONTINUED FROM PAGE 65

The answer lay in the RDBMS — in this case, Sybase, Inc.'s SQL Server, which offers the Net Gateway to access the DB2 database. Although Hamel was at first interested in IBM's RS/6000, he says he settled on the SPARCstation because "at that time [early 1991], IBM was having some problems with AIX on the RS/6000, which delayed shipment of Sybase Net Gateway for the AIX."

At this point, "all Unix systems are capable of doing client/server computing easily," says Nina Lytton, editor of the "Open Systems Advisor" in Boston.

IBM's most recent release of AIX sports improved I/O, which was the source of its problems in a client/server implementation, Willmott says. HP's HP/UX and Sun's Solaris, with the imminent 2.0 release, are considered the premier commercial Unix operating systems. DEC recently began shipping the Open Software Foundation's OSF/1 as its Unix operating system and, through Network Application Support, provides extensive support for client/server computing.

On the PC LAN

Organizations migrating to Unix servers from PC LANs are usually searching for better price/performance and greater scalability. The key requirement here is server support for PCs and PC network operating systems.

Just because you're at the LAN level, don't be fooled by your expandability requirements. In this regard, desktop servers generally offer fewer options than tower or rack-mount systems.

At CompuCheck, Fawcett ruled out all desktop servers because the small chassis limited expansion. "I need to be able to grow the number of PCs we support without the server degrading," he says.

No matter which kind of server you choose, the hardest decision you make will probably be whether to go the Unix route at all. "We were nervous about Unix," says Marshall Holman, vice president/senior operations officer at Charter Bancshares, the largest locally owned commercial bank in Houston. "It is not a simple decision to make."

But even historical bastions of proprietary IBM systems need to make some tough calls when the current system has hit the wall. In Holman's case, the System/36-based system was taking 10 to 12 hours to do "overnight" update processing. He could have upgraded, but "if we went with a proprietary IBM solution, we have to buy their computer and all that goes with it at their price," Holman says.

Holman replaced three System/36s with a DG four-processor Aviion Unix server running Enterprise 2000 banking software from Software Alliance Corp. Now, processing time is cut in half, and, according to Holman, the system can handle more than triple the bank's asset base without performance degradation.

Unix is no fairy tale — and please let's not call it "The Year of" anything. But if you are assured that you can make the leap, be comforted by the fact that there is no limit to Unix server choices. •

THIS IS WHAT A MASSACRE LOOKS LIKE IN THE WORLD OF APPLICATION DEVELOPMENT.

DATAPRO
DBMS USER SURVEY

	PROGRESS SOFTWARE	SYBASE	INFORMIX	INGRES	FOCUS	ORACLE
ATTRIBUTES						
Reliability	9.3	8.7	8.9	8.1	7.7	8.8
Ease of Use	9.1	8.2	8.2	7.9	7.9	7.4
Ease of Install/Upgrade	8.9	8.0	8.8	7.1	8.1	7.6
Price/Perform Return	9.1	8.3	8.5	7.5	8.1	7.1
FUNCTIONALITY						
Flexibility	9.1	8.8	8.6	9.0	8.4	8.6
Interface Capabilities	8.9	8.9	8.4	8.7	8.7	8.0
Comprehensiveness	9.1	8.8	8.8	8.3	8.7	8.7
User Friendliness	8.9	7.7	8.3	7.9	7.5	7.3
OS Compatibility	9.6	8.4	8.9	9.1	8.8	9.0
PRODUCT SUPPORT						
Documentation	9.0	8.2	8.6	5.7	6.2	7.3
Vendor Training	8.7	7.9	8.0	7.2	7.6	8.0
Problem Response Time	8.8	7.5	7.2	6.1	6.4	6.7
Quality of Vendor Support	9.0	7.8	7.5	6.4	6.9	7.0
Frequency of Releases	8.5	7.5	6.7	7.2	7.7	7.2
Response to User Request	8.8	7.5	7.8	7.0	7.0	7.3
Overall Satisfaction	9.3	8.7	8.5	8.3	8.0	7.9

Compiled from the 1991 Datapro Reports on Software/Computer System Series Software, available for each product listed (Sybase from 1992). The results are those of actual users of the products as surveyed by Datapro.

VARBUSINESS
DBMS REPORT CARD

	PROGRESS SOFTWARE	INFORMIX	ORACLE	ASHTON-TATE	INGRES
PRODUCT FEATURES					
Ease of use	9.02	7.07	6.00	6.19	5.90
Memory requirement	7.37	6.16	4.25	6.19	5.22
Ease of programming	9.03	7.09	6.06	6.20	5.90
Ability to manipulate data	9.19	7.41	7.44	6.81	5.67
Sorting capabilities	9.02	7.44	7.69	6.65	5.78
Provision for software security	8.56	6.93	7.28	5.07	5.78
Report writing capabilities	8.39	6.72	6.59	5.71	4.11
Ease of use of interface	8.51	7.05	6.15	6.10	6.10
Software integration capabilities	8.34	7.26	7.24	6.27	6.10
Ease of data retrieval	9.08	7.68	7.66	6.61	6.11
Satisfaction with product profitability	8.26	7.04	6.22	5.58	5.13
Overall quality of product	8.94	7.37	6.69	6.32	5.44
Product Features Average	8.64	7.10	6.61	6.14	5.60
SUPPORT FEATURES					
Provision for customer support	7.74	5.98	5.76	5.77	5.50
Charges for training time	6.88	4.49	4.59	5.64	4.56
Provision for technical support	7.81	5.76	5.72	5.87	5.22
Provision for marketing support	6.89	5.88	6.09	6.13	3.80
Documentation & product information	8.74	6.73	6.56	6.45	5.56
Frequency of updates & revisions	8.35	5.88	6.34	5.57	5.00
Support Features Average	7.73	5.79	5.84	5.90	4.94
Overall Average	8.34	6.66	6.35	6.06	5.38

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Rated on everything from performance and reliability to service and support, PROGRESS trounces all of its competitors in the 1991 Datapro user surveys and the 1991 VARBUSINESS Software Report Card.

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CPWADV0504

How tolerant can you be?

Downtime varies from minutes to hours per year, depending on server

BY MICHELLE LOUZON

"Fault tolerance" and "high availability" — the two phrases have achieved almost cliche status. Nearly every major hardware vendor has laid its claim to offering those features in its Unix servers.

Fault tolerance was once the domain of specialized servers (see chart at right), which promise minimal chance for hardware failure, are intended for applications that can afford little downtime and also support hundreds of users. Now, all the big names are muscling in, including **IBM, Hewlett-Packard Co., Unisys Corp.** and **Sun Microsystems, Inc.**

It's little wonder there's so much activity: The market is now worth $2.5 billion worldwide and is expected to grow to $11 billion by 1995, according to Jim Johnson, chairman of Standish Group International in Hyannis, Mass.

in Framingham, Mass. You should note, however, that most servers are written off in two to three years, according to Nili Young, a vice president at Meta Group, Inc. in Westport, Conn.

Applications best suited for a fault-tolerant machine include electronic funds transfer, point of sale, airline reservation systems and automatic warehouses. They are also used for communications applications such as emergency services and telephone switching.

High-availability applications are a little less critical and can include things such as decision support and manufacturing resource planning.

For true fault tolerance, you need to go to a specialized vendor. Choices include **Stratus Computer, Inc., Tandem Computers, Inc.** and **Sequoia Systems, Inc. Digital Equipment Corp.** plans to offer a Unix fault-tolerant machine within 24 months, Young says.

their market standing through alliances. Sequent has worked with **Novell, Inc.** to produce a hardier version of the popular NetWare local-area network operating system. The software, running on a Sequent server, supports 1,000 NetWare users, compared with the 70 to 100 supported on competing servers.

This technology will be resold to Novell and will be available to the competition in about a year, says George Weiss, an analyst at Gartner Group, Inc. in Stanford, Conn. The price of the NetWare software ranges from $1,500 to $17,500.

Likewise, Sequoia, in conjunction with **Oracle Corp.**, has produced a parallel server for the Oracle database. This software splits the work of the database among multiple processors in the same machine, thereby increasing the performance and number of users.

"This is a very good solution for companies who have the Oracle database and need to provide more people with access to information," says Wayne Kernochan, a senior analyst at The Yankee Group in Boston.

Competitors Pyramid and Sequent are now working with Oracle on their own versions of the parallel server. Sequoia's parallel server is $1,000 per user.

Another innovation offered by some specialized vendors is reduced instruction set computing (RISC) chips. Tandem, Stratus and Pyramid have all built machines with RISC chips, and Sequoia plans a similar offering by late 1993 or early '94. Although there has been a lot of hype surrounding RISC's price/performance advantages, "RISC is really important when you're doing graphics, complicated financial analysis and CAD/CAM," Kernochan says. "Something like an Intel chip may be better suited to transaction processing."

Another feature specialized vendors stress is their ability to provide symmetric multiprocessing, in which the work load is equally shared among many processors. Vendors offering symmetric multiprocessing include Sequent, Pyramid and Sequoia, with Stratus planning to offer this feature later this year.

While analysts agree that symmetric multiprocessing can improve performance, they also say it's not the only way. Perhaps its greatest advantage, though, is scalable growth. Whereas with a traditional asymmetric computer you'd need to buy another machine to add power, symmetric multiprocessors allow you to improve performance simply by adding more processors to an existing machine.

Scalable growth is turning out to be quite an advantage to the city of Lakewood, Colo., which uses a Sequoia computer.

"Right now, 300 people are connected to our system, but we expect to have 450 in a year and a half," says Tony Mineo, the city's director of data processing.

Speed — so what?

Performance is probably the area specialized vendors tout the loudest. Many of them have completed benchmarks in this area and are competing for the highest numbers. But it's not easy to distinguish among them on this basis.

"The truth is that everybody is close," says Rikki Kirzner, a senior industry analyst specializing in Unix software at Dataquest, Inc. in San Jose, Calif. "All the [specialized] players provide credible performance in this area, as do traditional vendors."

Buyers should generally beware of benchmarks. "Don't get confused by marketing hype, like when the vendor tells you that a system has this many MIPS or this many TPC-A's" (a Transaction Processing Council benchmark test), Morrell says. •

Isn't that special

A listing of specialized Unix server vendors, in order of descending market share

- **Stratus Computer, Inc.**
  X/A/R or XA2000
  Marlboro, Mass.
- **Sequoia Systems, Inc.**
  Series 400
  Marlboro, Mass.
- **Pyramid Technology Corp.**
  MIS Server
  Mountain View, Calif.
- **Sequent Computer Systems, Inc.**
  Symmetry 2000
  Beaverton, Ore.
- **Tandem Computers, Inc.**
  100E, 200 and 300E
  Cupertino, Calif.

Finding fault

Of the two types of Unix machines for mission-critical applications, fault-resilient (or high availability) machines are forecast to be the more popular

	1991	1993*	1995*	(Market revenue)
• Fault-tolerant	$4M	$1.8B	$4.2B	80%
• Fault-resilient	$1B	$3B	$6.8B	187%

* Projected
• Examples of fault-tolerant computers include Sequoia, Tandem Integrity and Stratus FTX.
• Examples of fault-resilient (or high-availability) machines include Pyramid Reliant or a server with failure features, such as an OLTP monitor.

Source: The Standish Group

CW Chart: Marie Haines

What buyers need to sort out first is which they need — fault tolerance or high availability (which are two very different things) — and second, whether to purchase from one of the general-purpose vendors or from a specialized one.

Fault-tolerant computers contain one or more duplicates of every part and guarantee maximum downtime of no more than minutes a year. High-availability products duplicate only critical components, offer fast recovery mechanisms and are down a maximum of eight hours a year. Compare that to conventional servers, which you can count on to be out of service for tens of hours a year.

In deciding between the two, you need to ask yourself, "How much downtime can I afford, and does that justify the expense of a fault-tolerant computer?" A fault-tolerant machine costs twice as much as a conventional system and 15% to 20% more than a high-availability computer, says John Morrell, a senior analyst specializing in Unix systems at International Data Corp.

Louzon is a free-lance writer based in Jersey City, N.J.

If you opt for high availability, you can choose one of the specialized vendors — such as **Pyramid Technology Corp.** or **Sequent Computer Systems, Inc.** — or go traditional, with IBM's High Availability/6000, HP's HP 9000, Unisys' U 6000 and Sun's SPARCserver 600 MP series. At this point, new market entrants are not a threat to the specialized vendors.

"Take, for example, the case of recovery," Morrell says. "When a processor fails on a specialized computer, the system comes down, sections off the faulty piece and then automatically starts computing again. Conventional vendors haven't yet learned how to restart their systems automatically."

But things will change. "In three years, Hewlett-Packard, IBM and DEC will be major contenders in the specialized server market," Young says. Competition will most likely drive some of the specialized players out of the market.

But specialized server vendors are not standing still; rather, they are actively working to develop new capabilities and market existing features.

Some vendors are improving

No reason to RISC everything

The onslaught of RISC has the Unix server market heated to boiling. According to International Data Corp., the RISC segment of the workstation server market grew 49% from 1990 to 1991. With DEC poised to release its RISC chip version — the Alpha chip — things will only get more interesting.

But even though RISC-based systems are getting the lion's share of attention, complex instruction set computing (CISC)-based Unix servers actually represent a large segment of the market. The Santa Cruz Operation's SCO Unix on (CISC-based) Intel Corp. machines is one of the leading Unix implementations.

The appeal of CISC-based Unix is that "the organization can maintain the simplicity of an all-Intel environment," says Nina Lytton, editor of the "Open Systems Advisor" newsletter in Boston.

Additionally, a new generation of CISC processors — such as Intel's I486 and soon-to-be-released 586 — promises to close the price/performance gap. John Ribble, associate commissioner at the Texas Rehabilitation Commission, wasn't worried about which chip was in the Unix server he chose for his company; he cared more that it could support Unix System V.

Ribble was searching for a server that would eventually rid him of the company's mainframe. Now in the first stage of the project, Texas Rehab examiners are working at LAN-connected PCs, accessing the mainframe database through an Intel-based Unix server acting as both a client to the mainframe and a local database server.

Ultimately, Ribble envisions each group of examiners working on a PC LAN with its own Unix server.

The winning bid for the client/server system came from a systems integrator that specified a Unisys Corp. U 6000 Unix server, a relational database management system from Informix Corp. and Unix System Laboratories, Inc.'s Tuxedo, an on-line transaction processing (OLTP) monitor. The work of the examiners is OLTP-intensive as they update case records.

Texas Rehab currently has the server configured with one processor, 32M bytes of memory and 345M bytes of storage.

ALAN RADDING

RISC-based servers

VENDOR	PRODUCT	NUMBER OF PROCESSORS MAXIMUM SPEED (MHz)	SERVER CONFIGURATION	OPERATING SYSTEMS SUPPORTED	NETWORK OPERATING SYSTEMS SUPPORTED	CHIP TYPE	MEMORY RANGE/CACHE SIZE	MAXIMUM DISK CAPACITY	NUMBER OF CLIENTS SUPPORTED IN BASE CONFIGURATION	CLIENTS SUPPORTED	DATABASES SUPPORTED	LAN PROTOCOLS SUPPORTED	SUPPORTS ETHERNET OR TOKEN RING	PERFORMANCE IN MIPS	PORTS INCLUDED	HIGH AVAILABILITY FEATURES	BASE PRICE
ASC Network Systems (313) 882-1133	ASC Supraserver	1 - 4/50	Tower, desktop (optional), rack mount (optional)	Unix, DOS/windows	NetWare (optional), LAN Manager (optional)	SPARC (optional), Intel 860, Intel 486	8M-512M/64K-256K	2G (up to 8G optional)	8, 16	DOS, OS/2, Unix, Windows	Oracle (optional), Dbase	TCP/IP (optional), Token Ring	Ethernet (optional), Token Ring (optional)	Up to 80+	8, 16 serial, 1, 2 audio, 1,2 mouse, 1,2, printer, Ethernet (optional), Token Ring (optional)	Cache, mirroring, arrays, dual power supply (optional), RAID (optional)	$9,860 includes 1 CPU, one-year warranty
Auspex Systems, Inc. (408) 492-0900	NS 5000	10/20	Rack mount	Sun OS	ONC/NFS	SPARC	36M-166M/16M-96M	81G	24	DOS, Unix, Macintosh, any NFS client	None	TCP/IP	Ethernet	NA	2 serial, 8 Ethernet	Cache, mirroring, arrays, spanning, striping, hot swapping	$115,000 includes 4 CPUs, 36M memory, 90-day warranty
Bull HN Information Systems, Inc. (508)294-6000	DPX/20 Product Line	1/25-50	Desktop, deskside	BOSX V 3.2 (proprietary Unix)	NetWare	IBM RS/6000	16M-512M/32K-64K (data), 8K (instruction)	160M-40G	1-150	Unix	Oracle, Ingres, Sybase, Informix	TCP/IP, FDDI, SNA	Ethernet, Token Ring	NA	306 serial, 4 audio, 1 mouse, 1 parallel printer, 306 serial printer, 4 Ethernet, 4 Token Ring, FDDI	Cache, mirroring, high availability NFS	$4,700-$62,550 includes 1 CPU, 16M-512M memory, three-month warranty (low end), one-year warranty (middle, high end)
CompuAdd Computer Corp. (800) 688-6380	CompuAdd SS.2	1/40	Desktop	Sun OS 4.1	NetWare	SPARC	8M-128M/64K	6G	15 diskless clients	Unix	Oracle, Ingres, Sybase, Informix	TCP/IP, SNA	Ethernet, Token Ring	28.5	2 serial, 1 audio, 1 mouse, 1 Ethernet	Cache	$9,895 includes 1 CPU, 16M memory, 16-in. color monitor, 250M disk, floppy disk, one-year on-site warranty
Control Data Corp. (612) 482-6736 (800) 257-6736	4680	1-4/60	Rack mount	EP/IX (proprietary Unix)	NetWare	Mips	128M-1G/592K	179G	NP	DOS, OS/2, Unix, Macintosh, Windows	Oracle, Ingres, Informix, BasicPlus	TCP/IP, DECnet, FDDI, SNA, OSI	Ethernet	272	2 serial, 1 Ethernet	Cache, mirroring, arrays, spanning, striping, hot swapping	$177,610 includes 1 CPU, 128M memory, 90-day warranty
	4375, 4370	1-8, 1-4/40	Rack mount, Tower	EP/IX (proprietary Unix)	NetWare	Mips	32M-256M/384K (1 CPU), 1152K (Multiple CPUs)	49G, 41G	NP	DOS, OS/2, Unix, Macintosh, Windows	Oracle, Ingres, Informix, BasicPlus	TCP/IP, DECnet, FDDI, SNA, OSI	Ethernet	286 (8 CPUs), 143 (4 CPUs)	NP	Cache, mirroring, spanning, striping	$59,260 (4375), $45,480 (4370) includes 1 CPU, 32M memory, 90-day warranty
	4350, 4360 Info-server	1/33	Tower	EP/IX (proprietary Unix)	NetWare	Mips	16M-128M (4350), 32M-256M (4360)/128K	11G, 147G	NP	DOS, OS/2, Unix, Macintosh, Windows	Oracle, Ingres, Informix, BasicPlus	TCP/IP, DECnet, FDDI, SNA, OSI	Ethernet	41	2 serial, 1 Ethernet (4360)	Cache, mirroring, spanning, striping, arrays (4360), hot swapping (4360)	$23,700 (4350), $57,500 (4360) includes 1 CPU, 16M memory (4350) 32M memory 4360), 90-day warranty
	4330 Info-server	1/33	Desktop	EP/IX (proprietary Unix)	NetWare	Mips	8M-128M/64K	6G	NP	DOS, OS/2, Unix, Macintosh, Windows	Oracle, Ingres, Informix, BasicPlus	TCP/IP, DECnet, FDDI, SNA, OSI	Ethernet	40	2 serial, 1 Ethernet	Cache, mirroring, spanning, striping	$9,190 includes 1 CPU, 8M memory, 90-day warranty
Data General Corp. (508) 366-8911	Aviion AV 8000, 6200 Server	4/25	Rack mount	DG/UX 5.4	NetWare, LAN Manager, Apple-Talk, Netbeui	Motorola	128M-768M (8000), 16M-832M (6200)/128K	134G	1,275	DOS,OS/2, Unix, Macintosh, Windows	Oracle, Ingres, Sybase, Informix, Progress, Cognos	TCP/IP, DECnet, FDDI, SNA, Openmac (8000), AppleTalk (6200), OSI	Ethernet, Token Ring	117 (4 CPUs)	1,275 serial, 8 Ethernet, 8 Token Ring	Mirroring, arrays, striping, hot swapping	$231,020 (8000) includes 4 CPUs, 128M memory, 90-day warranty; $97,015 (6200) includes 2 CPUs, 64M memory, 90-day warranty
	Aviion AV 7000 Server	4/25	Tower	DG/UX 5.4	NetWare, LAN Manager, Apple-Talk, Netbeui	Motorola	16M-512M/128K	13G	1,020	DOS, OS/2, Unix, Macintosh, Windows	Oracle, Ingres, Sybase, Informix, Progress, Cognos	TCP/IP, DECnet, FDDI, SNA, Openmac, OSI	Ethernet, Token Ring	117	1,020 serial, 4 Ethernet, 4 Token Ring	Arrays, striping, hot swapping, UPS	$96,500 includes 4 CPUs, 16M memory, 662M disk, 90-day warranty
	Aviion AV 5200 Server	1,2,4/25	Tower	DG/UX 5.4	NetWare, LAN Manager, Apple-Talk, Netbeui	Motorola	16M-576M/32K (single), 128K (per CPU for dual, quad processors)	21G	1,020	DOS, OS/2, Unix, Macintosh, Windows	Oracle, Ingres, Sybase, Informix, Progress, Cognos	TCP/IP, DECnet, FDDI, SNA, Openmac, OSI	Ethernet, Token Ring	29 (1 CPU), 58 (2 CPUs), 117 (4 CPUs)	1,020 serial, 4 Ethernet, 4 Token Ring	Mirroring, arrays, striping	$34,900 includes 1 CPU, 16M memory, 332M disk, 90-day warranty
	Aviion AV 4600 Server	1-2/33	Tower	DG/UX 5.4	NetWare, LAN Manager, Apple-Talk, Netbeui	Motorola	32M-128M/32K	18G	255	DOS, OS/2, Unix, Macintosh, Windows	Oracle, Ingres, Sybase, Informix, Progress, Cognos	TCP/IP, DECnet, FDDI, SNA, Openmac, OSI	Ethernet, Token Ring	39 (1 CPU), 78 (2 CPUs)	3 serial, 1 printer, 1 Ethernet	Mirroring	$19,995 includes 1 CPU, 32M memory, 332M disk, 90-day warranty
	Aviion AV 4300 Server, 4100 Server	1-2/25, 20	Tower	DG/UX 5.4	NetWare, LAN Manager, Apple-Talk, Netbeui	Motorola	16M-128M/32K	8.4G	255	DOS, OS/2, Unix, Macintosh, Windows	Oracle, Ingres, Sybase, Informix, Progress, Cognos	TCP/IP, DECnet, FDDI (4100) SNA, AppleTalk (4300), Openmac (4100), OSI	Ethernet, Token Ring	29, 23 (1 CPU), 58, 46 (2 CPU)	2 serial, 1 printer, 1 Ethernet	Mirroring	$13,995 (4300), $9,995 (4100), includes 1 CPU, 16M memory, 332M disk, 90-day warranty
Digital Equipment Corp. (800) 344-4825	DECsystem 5900	1/40	Tower, rack mount	Ultrix, OSF/1	Pathworks	Mips	64M-448M/128K	37.2G	281	DOS, OS/2, Unix, Macintosh, Windows	Oracle, Ingres, Sybase, Informix, Progress	TCP/IP, DECnet, FDDI, SNA, NFS, X.25	Ethernet	42.9	2 serial, 1 Ethernet	Mirroring	$59,050 includes 1 CPU, 64M memory, 1.38G disk, 600M CD-ROM, Prestoserve, one-year warranty
	DECsystem 5000 Model 240	1/40	Desktop	Ultrix, OSF/1	Pathworks	Mips	16M-480M/128K	33.1G	249	DOS, OS/2, Unix, Macintosh, Windows	Oracle, Ingres, Sybase, Informix, Progress	TCP/IP, DECnet, FDDI,SNA, NFS, X.25	Ethernet	42.9	2 serial, 1 Ethernet	Mirroring	$13,495 includes 1 CPU, 16M memory, one-year warranty

*IBM will begin shipping the RS/6000 PowerServer 970 on June 26. The base price will be $97,822 and will include 64M-byte memory, 2.7G-byte disk, Ethernet, diskette drive, integrated SCSI, CD-ROM, 8mm tape, AIX/6000 1-2 user license.

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Contact vendor for further product information.

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PRODUCT SPOTLIGHT

VENDOR	PRODUCT	NUMBER OF PROCESSORS MAXIMUM SPEED (MHz)	SERVER CONFIGURATION	OPERATING SYSTEMS SUPPORTED	NETWORK OPERATING SYSTEMS SUPPORTED	CHIP TYPE	MEMORY RANGE/CACHE SIZE	MAXIMUM DISK CAPACITY	NUMBER OF CLIENTS SUPPORTED IN BASE CONFIGURATION	CLIENTS SUPPORTED	DATABASES SUPPORTED	LAN PROTOCOLS SUPPORTED	SUPPORTS ETHERNET OR TOKEN RING	PERFORMANCE IN MIPS	PORTS INCLUDED	HIGH AVAILABILITY FEATURES	BASE PRICE
DEC (cont'd)	DECsystem 5000 Model 133	1/33	Desktop	Ultrix, OSF/1	Pathworks	Mips	8M-128M/192K	33.9G	146	DOS, OS/2, Unix, Macintosh, Windows	Oracle, Ingres, Sybase, Informix, Progress	TCP/IP, DECnet, FDDI, SNA, NFS, X.25	Ethernet	34.4	2 serial, 1 Ethernet	Mirroring	$7,925 includes 1 CPU, 8M memory, one-year warranty
	DECsystem 5000 Model 25	1/25	Desktop	Ultrix, OSF/1	Pathworks	Mips	8M-40M/128K	25.3G	136	DOS, OS/2, Unix, Macintosh, Windows	Oracle, Ingres, Sybase, Informix, Progress	TCP/IP, DECnet, FDDI, SNA, NFS, X.25	Ethernet	26.7	1 serial, 1 audio, 1 Ethernet	Mirroring	$4,295 includes 1 CPU, 8M memory, one-year warranty
Encore Computer Corp. (305) 587-2900	Infinity 90 Series	2-2,048/25	Tower, rack mount, cabinet	Umax V	NFS	Motorola	32M-57.3G/128K	132T	1,000	DOS, Unix, Macintosh, X Servers	Oracle, Ingres, Informix, Unify	TCP/IP, DECnet, FDDI, SNA, GOSIP, Netex/Hyper-channel, Network Reflective Memory, LocalTalk	Ethernet	40-17,000	4 serial, 1 mouse, 1 printer, 1 Ethernet	Cache, mirroring, spanning, striping, dual power supply, dual paths	$751,000 includes 4 CPUs, 192M memory, 4 I/O subsystem CPUs, 90-day warranty
	Encore 93 Series	4-32/25	Rack mount, cabinet	Umax V	NFS	Motorola	64M-640M/384K	600M-100G	NP	DOS, Unix, Macintosh, X Servers	Oracle, Ingres, Informix, Unify	TCP/IP, DECnet, FDDI, SNA, GOSIP, Network Reflective Memory	Ethernet	80-1,120	2 serial, 1 Ethernet, 1 SCSI channel	Cache, mirroring, spanning, striping	$159,900 includes 4 CPUs, 64M memory, 90-day warranty
	Encore 91 Series	2,4/25	Tower, rack mount, cabinet	Umax V	NFS	Motorola	16M-576M/32K-128K	600M-50G	505	DOS, Unix, Macintosh, X Servers	Oracle, Ingres, Informix, Unify	TCP/IP, DECnet, FDDI, SNA, GOSIP, Network Reflective memory	Ethernet	40-140	4 serial, 1 Ethernet, 1 SCSI channel	Cache, mirroring, spanning, striping	$49,000 includes 2 CPUs, 16M memory, 90-day warranty
Epoch Systems, Inc. (508) 836-4300 (800) 873-7624	Epoch-2 Data Server	1/40	Rack mount (hierarchi-cal storage server)	Sun OS 4.1.1	Unix	SPARC	16M-64M	13.2G (magnet-ic), 1M (optical)	50 dataless NFS clients	Unix	NA	TCP/IP, NFS	Ethernet	28.5	2 serial, 1-3 Ethernet, 2-3 SCSI channels	None	$93,900 includes 1 CPU, 16M memory, 5G tape drive, 20G optical library unit, 90-day warranty
Hewlett-Packard Co. (800) 752-0900	HP 9000 Series 800 Model 870S	1-4/50	Floor-standing	HP-UX	NetWare, LAN Manager	HP	96M-768M/-1024	514G	4-2000	DOS, OS/2, Unix, Macin-tosh, Windows	Oracle, Ingres, Sybase, Informix, Progress	TCP/IP, SNA, ARPA	Ethernet	56	4 serial, 1 Ethernet	Cache, mirroring, arrays, duplexing	$260,000-$530,000 includes 1-4 CPUs, 96M-192M memory, 90-day warranty
	HP 9000 Models 877S, 867S, 857S	1/64 (877S, 857S) NP	Tower, Rack mount	HP-UX	NetWare, LAN Manager	HP	64M-384M/512K	101 (867S), 130G (877S, 857S)	2-1000	DOS, OS/2, Unix, Macintosh, Windows	Oracle, Ingres, Sybase, Informix	TCP/IP, FDDI, SNA, OSI	Ethernet, Token Ring	NA	8 serial, 1 Ethernet	Cache, mirroring, arrays, striping	$148,000 (877S), $112,500 (867S),$95,000 (857S), includes 1 CPU, 64M memory (877S, 867S), 16M memory (857S), 90-day warranty
	HP 9000 Models 847S	1/NP	Tower, Rack mount	HP-UX	NetWare, LAN Manager	HP	32M-384M/512K	101.3G	2-1000	DOS, OS/2, Unix, Macintosh, Windows	Oracle, Ingres, Sybase, Informix	TCP/IP, FDDI, SNA, OSI	Ethernet, Token Ring	NA	8 serial, 1 Ethernet	Cache, mirroring, arrays, striping	$65,000 includes 1 CPU, 16M memory, 90-day warranty
	HP 9000 Models 837S, 827S, 817S, 807S	1/NP	Tower, Rack mount	HP-UX	NetWare, LAN Manager	HP	16M-128M (807S), 16M-192M (837S, 817S), 16M-384M (827S)/96K-512K, depending on model	28.5G (837S, 817S, 807S), 101.3G (827S)	2-1000	DOS, OS/2, Unix, Macintosh, Windows	Oracle, Ingres, Sybase, Informix	TCP/IP, FDDI, SNA, OSI	Ethernet, Token Ring	NA	8 serial, 1 Ethernet	Cache (all models), mirroring, arrays, striping (837S, 827S, 817S)	$12,395-$40,000, depending on model includes 1 CPU, 16M memory, 90-day warranty
IBM* (800) 426-3333	RS/6000 PowerServer 950	1/42	Rack mount	AIX/6000	NetWare	IBM Power	64M-512M/64K (data), 8K (instruction)	19.2G (inter-nal), 70.5G (exter-nal)	50-250	DOS, OS/2, Unix	Oracle, Ingres, Sybase, Informix, Progress, Unify, Empress	TCP/IP, DECnet, FDDI, SNA	Ethernet, Token Ring	NP	2 serial, 1 printer, Ethernet (optional), Token Ring (optional)	Mirroring, spanning, duplexing, AIX high avail-ability/6000 Software	$82,822 includes 1 CPU, 64M memory, 1.7G disk, Ethernet, SCSI drawer, CD-ROM, 8mm tape, AIX/6000 1-2 user license, 7 I/O slots, one-year warranty
	RS/6000 PowerServer 560, 550	1/50, 42	Tower	AIX/6000	NetWare	IBM Power	64M-512M/64K (data), 8K (instruction)	6G (inter-nal), 39.5G (exter-nal)	25-150	DOS, OS/2, Unix	Oracle, Ingres, Sybase, Informix, Progress, Unify, Empress	TCP/IP, DECnet, FDDI, SNA	Ethernet, Token Ring	NP	2 serial, 1 audio, 1 mouse, 1 printer, Ethernet (optional), Token Ring (optional), 1 tablet port	Mirroring, spanning, duplexing, AIX availabili-ty/6000 software	$62,242 (560), $57,242 (550), includes 1 CPU, 64M memory, 7 I/O slots, 800M disk, Ethernet, SCSI, diskette drive, 0.50-in. tape drive, AIX/6000 1-2 user license, one-year warranty
	RS/6000 PowerServer 530H, 520H	1/33, 25	Tower	AIX/6000	NetWare	IBM Power	32M-512M (530H), 16M-512M (520H)/64K data(530H), 32K data (520H), 8K instruction	6G (maxi-mum in-ternal), 39.5G (maxi-mum ex-ternal)	25-150	DOS, OS/2, Unix	Oracle, Ingres, Sybase, Informix, Progress, Unify, Empress	TCP/IP, DECnet, FDDI, SNA	Ethernet, Token Ring	NP	2 serial, 1 audio, 1 mouse, 1 printer, Ethernet (optional), Token Ring (optional), 1 tablet port	Mirroring, spanning, duplexing, AIX high avail-ability/6000 software	$36,242 (530H), $26,242 (520H), includes 1 CPU, 32M memory (530H), 16M memory (520H), 7 I/O slots, 400M disk, Ethernet, SCSI diskette drive, 0.25-in. tape drive, AIX/6000 1-2 user license, one-year warranty
	RS/6000 PowerServer 350	1/42	Desktop	AIX/6000	NetWare	IBM Power	32M-128M/32K (data), 8K (instruction)	2G (maxi-mum in-ternal), 30G (maxi-mum ex-ternal)	5-50	DOS, OS/2, Unix	Oracle, Ingres, Sybase, Informix, Progress, Unify, Empress	TCP/IP, DECnet, FDDI, SNA	Ethernet, Token Ring	NP	2 serial, 1 audio, 1 mouse, 1 printer, Ethernet (integrated), Token Ring (optional), 1 tablet port	Mirroring, spanning, duplexing, AIX high avail-ability/6000 software	$26,790 includes 1 CPU, 32M memory, 4 I/O slots, 400M disk, Ethernet, SCSI, diskette drive, 0.25-in. tape drive, AIX/6000 1-2 user license, one-year warranty
	RS/6000 PowerServer 340, 320H	1/33, 25	Desktop	AIX/6000	NetWare	IBM Power	16M-128M/32K (data), 8K (instruction)	2G, 800M (inter-nal), 30G, 8.8 (maxi-mum ex-ternal)	5-50	DOS, OS/2, Unix	Oracle, Ingres, Sybase, Informix, Progress, Unify, Empress	TCP/IP, DECnet, FDDI, SNA	Ethernet, Token Ring	NP	2 serial, 1 audio, 1 mouse, 1 printer, Ethernet (integrated in 340; optional in 320H), Token Ring (optional), 1 tablet port	Mirroring, spanning, duplexing, AIX high avail-ability/6000 software	$18,790 (340), $15,842 (320H), includes 1 CPU, 16M memory, 4 I/O slots (340), 3 I/O slots (320H), 400M disk, Ethernet, SCSI, diskette drive, 0.25-in. tape drive, AIX/6000 1-2 user license, one-year warranty

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PRODUCT SPOTLIGHT

VENDOR	PRODUCT	NUMBER OF PROCESSORS MAXIMUM SPEED (MHz)	SERVER CONFIGURATION	OPERATING SYSTEMS SUPPORTED	NETWORK OPERATING SYSTEMS SUPPORTED	CHIP TYPE	MEMORY RANGE/CACHE SIZE	MAXIMUM DISK CAPACITY	NUMBER OF CLIENTS SUPPORTED IN BASE CONFIGURATION	CLIENTS SUPPORTED	DATABASES SUPPORTED	LAN PROTOCOLS SUPPORTED	SUPPORTS ETHERNET OR TOKEN RING	PERFORMANCE IN MIPS	PORTS INCLUDED	HIGH AVAILABILITY FEATURES	BASE PRICE
IBM (cont'd)	RS/6000 PowerServer 220	1/33	Desktop	AIX/6000	NetWare	IBM Power	16M-64M/8K	1G (maximum internal), 5G (maximum external)	5-16	DOS, OS/2, Unix	Oracle, Ingres, Sybase, Informix, Progress, Unify, Empress	TCP/IP, DECnet, FDDI, SNA	Ethernet, Token Ring	NP	2 serial, 1 audio, 1 mouse, 1 printer, Ethernet (integrated), Token Ring (optional), 1 tablet port	Mirroring, spanning, duplexing, AIX high availability 6000 software	$9,715 includes 1 CPU, 16M memory, 2 I/O slots, 400M disk, Ethernet, SCSI, 0.25-in. tape drive, AIX/6000 1-2 user license, one-year warranty
Intergraph Corp. (205) 730-2000	InterServe 6409	1/30	Rack mount	Unix	NetWare	Clipper RISC	64M-1G/192K	33G	50-200	Unix	Oracle, Ingres, Informix	TCP/IP, DECnet, FDDI (optional), SNA	Ethernet, Token Ring	36	3 serial, 1 Ethernet, Token Ring (optional), 1 parallel	Cache	$82,900 includes 1 CPU, 16M memory
	InterServe 6605	1/40	Rack mount	Unix	NetWare	Clipper RISC	64M-832M/128K	33G	50-250	Unix	Oracle, Ingres, Informix	TCP/IP, DECnet, FDDI (optional), SNA	Ethernet, Token Ring	48	3 serial, 1 Ethernet, Token Ring (optional), 1 parallel	Cache	$75,000 includes 1 CPU, 16M memory
	InterServe 6405	1/30	Rack mount	Unix	NetWare	Clipper RISC	32M-1G/192K	33G	25-150	Unix	Oracle, Ingres, Informix	TCP/IP, DECnet, FDDI (optional), SNA	Ethernet, Token Ring	36	3 serial, 1 Ethernet, Token Ring (optional), 1 parallel	Cache	$47,900 includes 1 CPU, 16M memory
	InterServe 6400	1/30	Tower	Unix	NetWare	Clipper RISC	16M-256M/192K	5G	10-50	Unix	Oracle, Ingres, Informix	TCP/IP, DECnet, FDDI (optional), SNA	Ethernet, Token Ring	36	3 serial, 1 Ethernet, Token Ring (optional), 1 parallel	Cache	$22,900 includes 1 CPU, 16M memory, 90-day warranty
Mips Computer Systems, Inc. (408) 720-1700	RC6380-100/400	1-4/60	Rack mount	Unix System V Release 4	NetWare, TCP/IP	Mips	128M-1G/592K	300G	200	DOS, OS/2, Unix, Macintosh, Windows	Oracle, Ingres, Sybase, Informix	TCP/IP, DECnet, FDDI, SNA	Ethernet, Token Ring	62	2 serial, 1 Ethernet	Cache, mirroring, arrays, spanning, striping	$196,500 includes 1 CPU, 128M memory, SCSI, Ethernet, room for 21 disks and 3 tapes, 90-day warranty
	RC6260	1/60	Tower	Unix System V Release 4	NetWare, TCP/IP	Mips	32M-512M/592K	41G	150	DOS, OS/2, Unix, Macintosh, Windows	Oracle, Ingres, Sybase, Informix	TCP/IP, DECnet, FDDI, SNA	Ethernet, Token Ring	62	2 serial, 1 Ethernet	Cache, mirroring, arrays, spanning, striping	$79,000 includes 1 CPU, 32M memory, SCSI, Ethernet, room for 4 disks and 2 tapes, 90-day warranty
	RC3360, RC3350	1/33	Rack mount, tower	Unix System V Release 4	NetWare	Mips	32M-256M (3360), 16M-128M (3350)/64K	20G, 12G	512, 256	Unix	Oracle, Ingres, Sybase, Informix	TCP/IP, DECnet, FDDI, SNA	Ethernet	41.5	1 Ethernet, 1 SCSI	Cache, mirroring, spanning, arrays, striping	$56,600 (RC3360), $25,000 (RC3350) includes 1 CPU, 32M memory (RC3360), 16M memory (RC3350), 90-day warranty
	Millenium SC-50, PC-50	1/50	Tower	Unix System V Release 4	NetWare	Mips	256M/8K, 1M secondary cache (SC-50)	7G	NP	Unix	Oracle, Ingres, Sybase, Informix	TCP/IP, DECnet, FDDI, SNA	Ethernet, Token Ring	NP	2 serial, 1 audio, 1 mouse, 1 parallel printer, 1 Ethernet, 1 SCSI	Cache, mirroring, arrays, spanning, striping	$16,990 (SC-50), $11,990 (PC-50) includes 1 CPU, 90-day warranty
	RC3330, RC3230	1/33, 25	Desktop	RISC/OS	NetWare	Mips	128M/32K	6.5G	NP	Unix	Oracle, Ingres, Sybase, Informix	TCP/IP, DECnet, FDDI, SNA	Ethernet	41.5, 30.8	2 serial, 1 Ethernet, ENET SCSI	Cache, mirroring, arrays, spanning, striping	$10,990 (RC3330), $8,990 (RC3230) includes 1 CPU, 8M memory, 90-day warranty
Mobius Computer Corp. (510) 460-5252	Mobius Mirage IPS/2	1/40	Desktop	Solaris 1.0.1, Sun OS 4.1.2	ONC/NFS	SPARC	16M-64M/64K	1.2G	Application-dependent	Unix	Any SPARC-compatible application	TCP/IP, FDDI (optional)	Ethernet	28.5	2 serial, 1 audio, 1 mouse, 1 Ethernet	Cache, mirroring, arrays, spanning, striping, duplexing, dual power supply, hot swapping (all optional)	$9,870 includes 1 CPU, 16M memory, one-year time and materials warranty
	Mobius Mirage IPS	1/25	Desktop	Solaris 1.0.1, Sun OS 4.1.2	ONC/NFS	SPARC	8M-64M/64K	1.2G	Application-dependent	Unix	SPARC-compatible application	TCP/IP, FDDI (optional)	Ethernet	15.8	2 serial, 1 audio, 1 mouse, 1 Ethernet	Cache, mirroring, arrays, spanning, striping, duplexing, dual power supply, hot swapping (all optional)	$6,490 includes 1 CPU, 8M memory, one-year time and materials warranty
Motorola, Inc. (800) 624-8999 Ext. 165	Motorola Series 8000 Models 8220, 8420	1/25	Desktop (8220), Tower (8420)	Unix	TCP/IP	Motorola	16M-64M/32K	520M-2G (internal), 5.2G (external)	NP	DOS, Unix, Macintosh	Oracle, Ingres, Sybase, Informix, Progress, Unidata, Universe	TCP/IP, DECnet, SNA, X.25	Ethernet	35	4 serial, 1 printer, 1 Ethernet	Mirroring, spanning, striping	$10,995 (8420), $8,995 (8220) includes 1 CPU, 16M memory, 180M disk, one-year warranty
NCR Corp. (800) 637-2600	NCR System 7000, Models 7020, 7040, 7120	1-12/33	Tower, rack mount	Unix System V Release 4	LAN Manager	MIPs	32M-512M/128K, 4M secondary per CPU	128G	16-1,024	Unix, Windows, X terminals	Oracle, Ingres, Sybase, Informix, Unify, Unidata	TCP/IP, FDDI, SNA, Datakit, BX.25, X.25	Ethernet	25-360	1,024 maximum serial (optional), 1 printer, Ethernet (optional), 1 console term	Cache, mirroring, arrays, striping, hot swapping, UPS	$102,000 includes 1 CPU, 32M memory, 2 663 disk drives, 16 ports, 320/525 M QIC tape, Unix, one-year warranty
	3B2 R3	1/33	Desktop, Tower, rack mount	Unix System V Release 4.0.3	NetWare, LAN Manager, Stargroup	Mips	16M-256M/512K	50G	Application-dependent	DOS, Unix, Windows, X terminals	Oracle, Informix, Unify	TCP/IP, SNA, Stargroup, Datakit, ISN	Ethernet	25	256 serial, universal serial printer, 4 Ethernet	Mirroring, arrays, striping, duplexing, ECC, HA Software	$49,900-$74,900 includes 1 CPU, 16M disk, 16M or 32M memory, 320/525 tape, 600M-1.2G SCSI disk, Unix, one-year warranty

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PRODUCT SPOTLIGHT

VENDOR	PRODUCT	NUMBER OF PROCESSORS MAXIMUM SPEED (MHz)	SERVER CONFIGURATION	OPERATING SYSTEMS SUPPORTED	NETWORK OPERATING SYSTEMS SUPPORTED	CHIP TYPE	MEMORY RANGE/CACHE SIZE	MAXIMUM DISK CAPACITY	NUMBER OF CLIENTS SUPPORTED IN BASE CONFIGURATION	CLIENTS SUPPORTED	DATABASES SUPPORTED	LAN PROTOCOLS SUPPORTED	SUPPORTS ETHERNET OR TOKEN RING	PERFORMANCE IN MIPS	PORTS INCLUDED	HIGH AVAILABILITY FEATURES	BASE PRICE
NCR (cont'd)	Star Server FT, Release 2	1 logical/25	Cabinet	Unix System V Release 3	NFS	Mips	32M-192M/32K	27G	Varies by environment	DOS, Unix, Macintosh, Windows	Oracle, Informix, Unify	TCP/IP, SNA, OSI	Ethernet	21	16 serial, 1 printer, 1 Ethernet	Cache, mirroring, striping, dual power supply, hot swapping, redundant CPU, IOP, power distribution, memory	$171,800 includes 1 logical CPU, 32M memory, Unix, one-year warranty
Pyramid Technology Corp. (408) 428-9000	MIServer 12S	12/33	Tower	DC/OSX (Unix)	NetWare	Mips	32M-512M/64K	113G	512	Unix	Oracle, Ingres, Informix, Pick, Unify	TCP/IP, SNA, X.25, BSC, NFS	Ethernet	25-300	512 serial	Cache, mirroring, arrays, spanning, striping, duplexing, dual power supply, hot swapping	$368,000 includes 1 CPU, 128K memory, 90-day warranty
	MIServer 4S	4/33	Tower	DC/OSX (Unix)	NetWare	Mips	32M-512M/64K	85G	512	Unix	Oracle, Ingres, Informix, Pick, Unify	TCP/IP, SNA, X.25, BSC, NFS	Ethernet	25-100	512 serial	Cache, mirroring, arrays, spanning, striping, duplexing, dual power supply, hot swapping	$272,000 includes 1 CPU, 32M memory, 90-day warranty
	MIServer 1S, MIServer 2S	1,2/33	Tower	DC/OSX (Unix)	NetWare	Mips	32M-128M (1S), 32M-256M (2S)/128K (1S), 64K (2S)	663M-3G (1S), 23G (2S)	16, 128	Unix	Oracle, Ingres, Informix, Pick, Unify	TCP/IP, SNA, X.25, BSC, NFS	Ethernet	25, 25-50	16 serial, 128 serial	Cache, mirroring, arrays, spanning, striping, duplexing, dual power supply, hot swapping	$93,000 (1S), $138,000 (2S) includes 1 CPU, 32M memory, 90-day warranty
Silicon Graphics, Inc. (800) 800-4774	DataStation 2, PowerFile 50, PowerFile 100	1-8/35	Tower, rack mount	Irix 4.0	NFS	Mips	16M-256M/64K-4Kx64K	8.4G (Datastation 2), 125G (PowerFile 50, PowerFile 125)	100	DOS, OS/2, Unix, Macintosh, Windows	Oracle, Ingres, Sybase, Informix	TCP/IP, DECnet, FDDI, SNA, NFS, AppleTalk	Ethernet	33-117, depending on model	4,8 serial, 1 audio, 1, 2 Ethernet, 1 parallel port	Cache, mirroring, striping, on-line disk management	$26,395 (Datastation 2), $105,000 PowerFile 50), $165,000 (PowerFile 100), includes 1,2,4 CPUs, 16M, 32M, 64M memory, 90-day warranty
	Iris POWER Center servers	1-8/33, 40	Tower, rack mount	Irix 4.0	NFS	Mips	8M-256M/64K x 8K x 64K	125G	NP	DOS, OS/2, Unix, Macintosh, Windows	Oracle, Ingres, Sybase, Informix	TCP/IP, DECnet, FDDI, SNA, NFS	Ethernet	30-286	2-16 serial, 1 audio, 2 Ethernet, 1 parallel port	Cache, striping	$24,900-$164,900 includes 1-8 CPUs, 8M memory, 90-day warranty
	Iris Indigo Server	1/33	Desktop	Irix	NFS	Mips	8M-96M/32K	32G (internal), 8.4G (external)	6-24	DOS, Unix, Macintosh	Oracle, Ingres, Sybase, Informix	TCP/IP, DECnet, FDDI, SNA	Ethernet	30	2 serial, 5 audio, 1 mouse, 1 printer, 1 Ethernet	Cache, mirroring, striping	$6,400 includes 1 CPU, 8M memory, 90-day warranty
Stratus Computer, Inc. (508) 460-2000	XA/R Series Model 300	2/32	Rack mount	FTX (SVR 4), VOS	StrataLink StrataNet	Intel 860	32M-256M/520K	100G	300	DOS, OS/2, Unix, Macintosh,	Oracle, Sybase, Informix, Pick	TCP/IP, SNA	Ethernet, Token Ring	40	436 serial, 8 Ethernet, 4 Token Ring, 1760 Asynch	Cache, duplexing, dual power supply	$343,000 includes 2 CPUs, 32M memory, 0.3G disk capacity, FTX
	XA/R Series Model 20	2/32	Rack mount	FTX (SVR 4), VOS	StrataLink StrataNet	Intel 860	32M-256M/520K	37G	250	DOS, OS/2, Unix, Macintosh, Windows	Oracle, Sybase, Informix, Pick	TCP/IP, SNA, OSI	Ethernet, Token Ring	40	176 serial, 8 Ethernet, 4 Token Ring, 600 Asynch	Cache, duplexing, dual power supply	$247,000 includes 2 CPUs, 32M memory
Sun Microsystems Computer Corp. (415) 960-1300	SPARCserver 690MP, 670MP	2, 4/40	Data center, deskside	Solaris	ONC	SPARC	64M-640M/64K per CPU	52G, 26G	130	Unix	Oracle, Ingres, Sybase, Informix	TCP/IP, FDDI	Ethernet	NA	2 serial, multiple Ethernet	None	$92,000 (690MP), $60,000 (670MP), includes 2 CPUs, 64M memory, 90-day parts and labor warranty
	SPARCserver 630MP	2, 4/40	Deskside	Solaris	ONC	SPARC	64M-128M/64K per CPU	26G	50	Unix	Oracle, Ingres, Sybase, Informix	TCP/IP, FDDI	Ethernet	NA	2 serial, multiple Ethernet	None	$45,000 includes 2 CPUs, 64M memory, 90-day parts and labor warranty
	SPARCserver 2	1/40	Desktop	Solaris	ONC	SPARC	32M-128M/64K per CPU	20.8G	26	Unix	Oracle, Ingres, Sybase, Informix	TCP/IP, FDDI	Ethernet	NA	2 serial, 1 audio, 1 mouse, multiple Ethernet	None	$15,195 includes 1 CPU, 32M memory, 90-day parts and labor warranty
Tandem Computers, Inc. (408) 285-6000	Integrity Series S100E, S200, S300	1 logical/33	NP	Unix System 5, Release 3.4	NP	Mips	16M-192M/64K data, instruction	27G	Varies by environment	DOS, Unix, Macintosh, Windows	Oracle, Ingres, Informix, Progress, Empress, Unidata, Unify, Vmack	TCP/IP, DECnet, SNA	Ethernet, X.25	12, 18	2 serial, 2 printer, 1 Ethernet	Cache, mirroring, duplexing, dual power supply, hot swapping, fully redundant	$94,500 includes 1 logic CPU, 16M memory
Torque Systems, Inc. (415) 321-1200	Compute-Server	1-10/40	Desktop, tower	Unix	NetWare	Intel 860	8M-320M/120K	5G	10	DOS, Unix, Macintosh, SPARC	None	TCP/IP, FDDI	Ethernet	50-500	1 printer, 1 Ethernet	None	$11,900 includes 1 CPU, 8M memory, one-year warranty
Twinhead Corp. (408) 945-0808	Twinstation-MP	2/40	Desktop	Solaris 1.0.1	NFS	SPARC	16M-128M/128K	2.4G (internal)	64	Unix	Oracle, Ingres, Sybase, Informix	TCP/IP	Ethernet	60	2 serial, 1 audio, 1 mouse, 1 Ethernet	None	$14,495 includes 2 CPUs, 16M memory, one-year warranty

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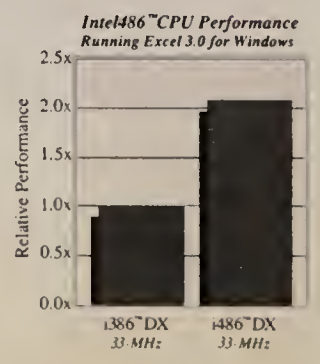

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The Computer Inside.™

DEC's Rdb excels in relational DBMS field

BY DEREK SLATER
CW STAFF

Digital Equipment Corp.'s Rdb does not attempt to be all things to all people. Unlike many of its competitors, Rdb does not run on a vast array of hardware platforms, finding its home only on DEC's VAX systems. But what it does, it evidently does well: Rdb users surveyed by *Computerworld*'s Buyers' Scorecard gave the product top marks.

With an overall score of 74, Rdb bested four other leading relational database management system products for minicomputers and Unix servers in user esteem. When grades from their respective users were tallied, Oracle Corp.'s Oracle received a final grade of 72, The Ask Cos.' Ingres and Sybase, Inc.'s Sybase both scored a 70, and Informix Corp.'s Informix ended up with 65.

Total possible score	100
Mean score	70

Users gave 1-to-10 ratings based on their satisfaction with their RDBMS in 15 specific categories. They also rated the relative importance of each category (see methodology next page for a detailed description of how the total score for each product was derived).

No category ranked higher in importance than service and support, and DEC's Rdb placed head and shoulders above its competitors in the two service-related areas: responsiveness of vendor service (8.0) and quality of vendor support (7.5). Rdb also earned an 8.0 in multilevel security features.

Rdb fared less well in performance ratings, finishing near the back of the pack for performance in decision-support applications (6.8) and performance in processing on-line transactions (7.1). The performance results cannot be attributed to hardware platform differences, as more than half of the Oracle, Ingres and Sybase users who responded to the survey also run those databases on DEC VAX systems.

Oracle's highest score was in the area of support for standard SQL (8.4), where it outscored the competitors. The product also topped the ratings in providing effective end-user tools (7.2) and integration of computer-aided software engineering tools (6.9), though users placed that category last in importance. Oracle managed first- or second-place finishes in all six of the key ratings categories. Its lowest marks came in system monitoring capability and distributed updating, recovery and remote administration (6.6 in both categories).

Areas of strength for Ingres were support for application development tools (7.5) — its one top score — and support for standard SQL (7.9).

Sybase users noted their product's speed, awarding Sybase top marks in performance in processing on-line transactions (8.4) and performance in decision-support applications (7.3). Sybase also placed first in useful SQL extensions (8.0) but trailed the other products in effective end-user tools (5.7).

Informix scored its best marks in support for standard SQL (7.8) and useful SQL extensions (7.2). However, it placed last or tied for last in 13 areas. •

Midrange relational database management systems

Total scores reflect average user ratings for all measured areas, weighted by user-assigned importance. Response base: Rdb: 33, others: 50.

Product	Highest ratings	Lowest ratings
DEC's Rdb SCORE 74	Support for standard SQL Multilevel security functions Responsiveness of vendor service	Integration of CASE tools Effective end-user tools Decision-support performance
Oracle's Oracle SCORE 72	Support for standard SQL Useful SQL extensions Support for application development tools	System monitoring capability Distributed updating and recovery System administration functionality
Sybase's Sybase SCORE 70	Performance in processing on-line transactions Support for standard SQL Useful SQL extensions	System monitoring capability Effective end-user tools Integration of CASE tools
Ask's Ingres SCORE 70	Support for standard SQL Support for application development tools Multilevel security features	Integration of CASE tools System monitoring capability System administration functionality
Informix's Informix SCORE 65	Support for standard SQL Useful SQL extensions Performance in processing on-line transactions	Integration of CASE tools System monitoring capability Quality of support

KEY RATINGS

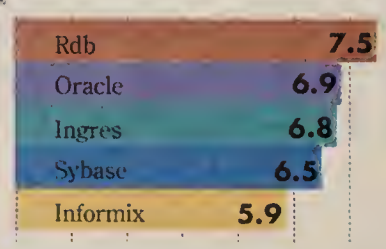
The six key categories are topped by four different products. DEC's Rdb tops the two most important areas, according to users, with wide margins in both responsiveness of vendor service and quality of vendor support. Sybase takes blue ribbons in the next two categories.

(Detailed ratings on next page)

User importance rating:

8.4 Responsiveness of vendor service

8.3 Quality of vendor support

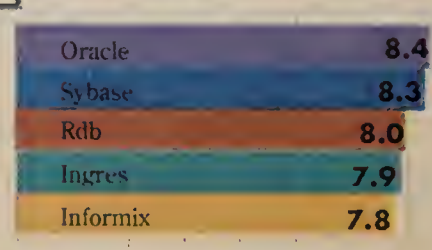


7.9 Support for complex tables and processing reports

7.8 Performance in processing on-line transactions

7.6 Support for application development tools

7.6 Support for standard SQL

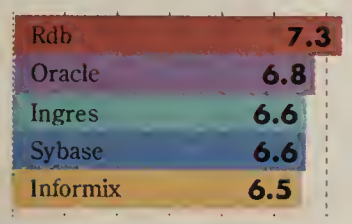


A CLOSER LOOK

Midrange RDBMSs (continued from previous page):

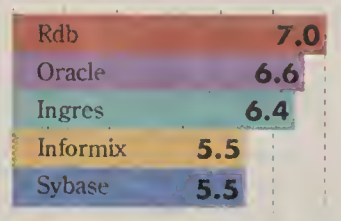
Top-scoring Rdb places first in four areas; Sybase takes three. Informix finds itself in fifth place six times.

7.6 System administration functionality

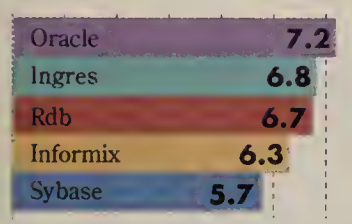


7.4 Control over transactions

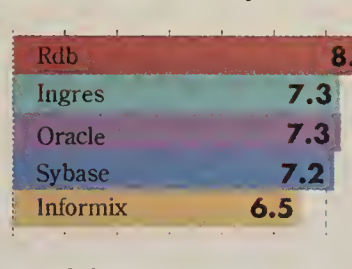
7.4 System monitoring capability



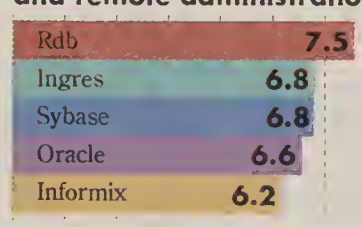
7.3 Effective end-user tools



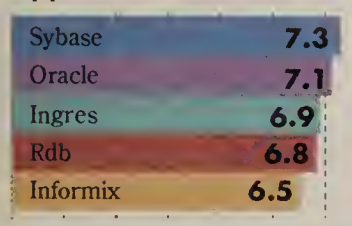
7.2 Multilevel security features



7.0 Distributed updating, recovery and remote administration

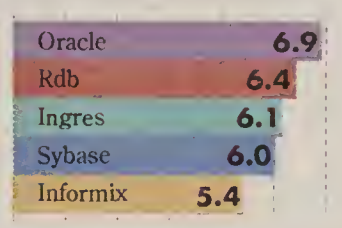


6.7 Performance in decision-support applications



6.7 Useful SQL extensions

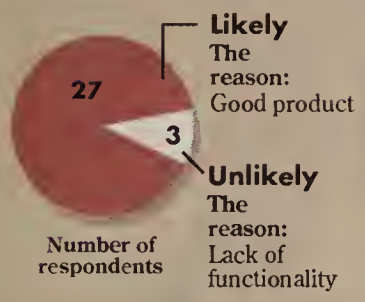
5.7 Integration of CASE tools



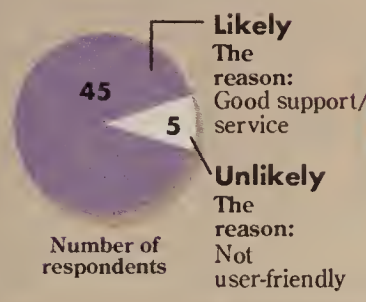
Loyalties

Would you buy the product again?
(Reasons are based on most frequently stated answer)

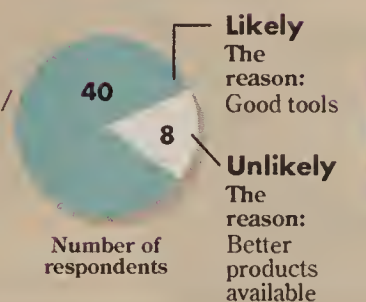
Rdb
Responses: 30



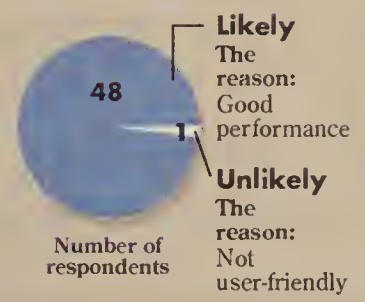
Oracle
Responses: 50



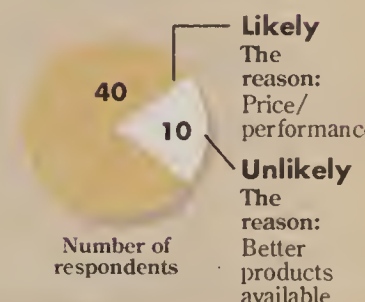
Ingres
Responses: 48



Sybase
Responses: 49



Informix
Responses: 50



Verbatim

What do you like best/least about this product?
(Responses are based on most frequently stated answer. Quotes are selected from user responses.)

Rdb

Likes
Flexibility
"It grows well with our system."

Dislikes
Difficult to use
"It seems extremely cumbersome sometimes."

Oracle

Likes
Flexibility/Portability
"It runs on a lot of platforms and has very flexible development tools."

Dislikes
Weak end-user tools
"End-user query tools don't insulate them from SQL language well enough."

Sybase

Likes
Speed
"It's extremely fast and efficient."

Dislikes
Weak end-user tools
"Front-end tools have been slow to be developed."

Ingres

Likes
Development tools
"The technical quality of the developer tools is very strong."

Dislikes
Poor support
"The vendor is not responsive when we cannot get the upgrade to work."

Informix

Likes
Ease of use
"It's very easy to use; functions within the 4GL save lots of time."

Dislikes
Poor support
"Technical support from the vendor is very poor."

Vital statistics

Total number of respondents: 232

What is your position?

IS director	28
IS manager	100
IS staff	71
Other	33

For how many years have you been involved with midrange RDBMs?

Five or more years	135
3-4 years	58
1-2 years	33
Less than one year	6

For which types of applications are you primarily using this product?

On-line transaction processing	167
Decision-support applications	77
Batch processing jobs	74
Customer service applications	52
Other	60

What is your responsibility for midrange RDBMs?

Evaluate or recommend vendors	205
Determine need	187
Set standards	176
Select vendors	151

METHODOLOGY

Products in this week's Buyers' Scorecard are installed base leaders among relational database management systems running on minicomputers and Unix servers.

User names were provided by nonvendor sources. The response base was 50 users each for Oracle Corp.'s Oracle, Sybase, Inc.'s Sybase, The Ask Cos.' Ingres and Informix Corp.'s Informix, while 33 users responded for Digital Equipment Corp.'s Rdb.

First Market Research in Austin, Texas, conducted the telephone survey and tabulated the results.

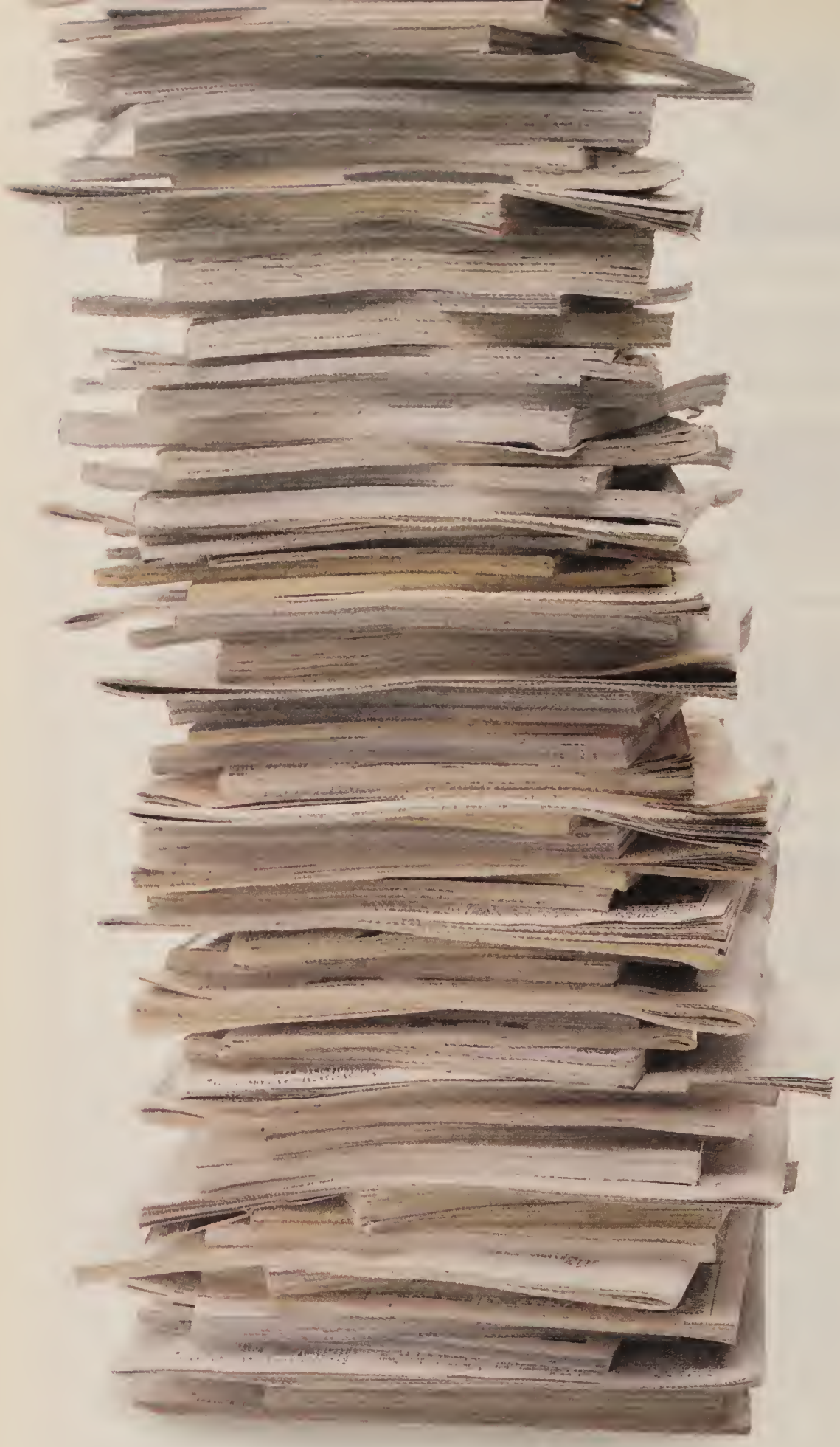
To compute the overall score for each product, perform the following steps: 1) Multiply the product's score in the first category by the user importance rating for that category to obtain the weighted score. 2) Repeat the process for all ratings areas. 3) Average the resulting figures for the average weighted score. 4) Convert the average weighted score to base 100.

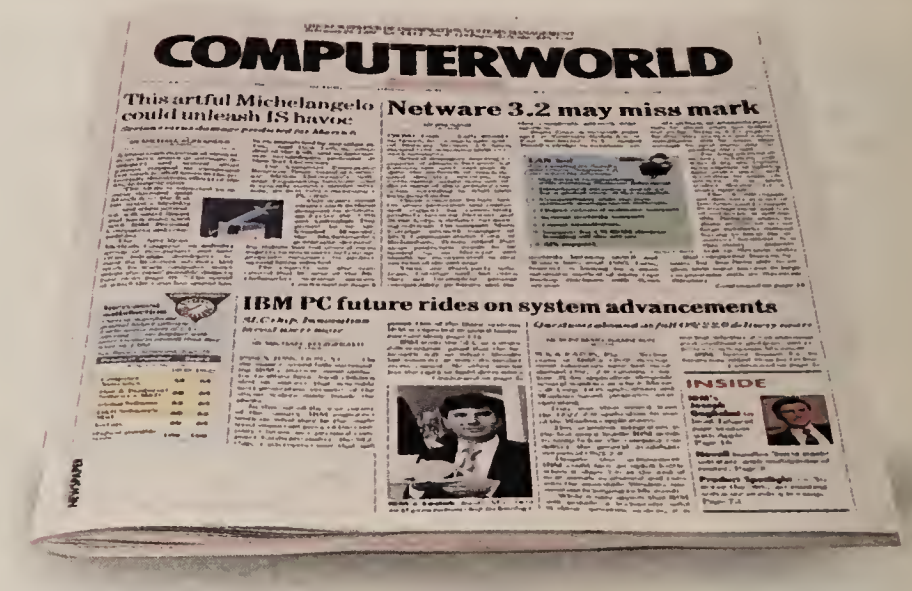
The ratio of the average weighted score to the average user importance rating equals the ratio of the overall score to 10. Numbers are rounded off where necessary.

Among the respondent base, the following hardware platforms were reported: DEC VAX, 134; Unix server, 58; minicomputer, 18; other, 45. More than half of the respondents (115 total) reported using their database management system in a client/server architecture.

ACKNOWLEDGMENTS

Computerworld thanks the following companies for their help in preparing this Buyers' Scorecard: Computer Intelligence; David McGoveran, Alternative Technologies.





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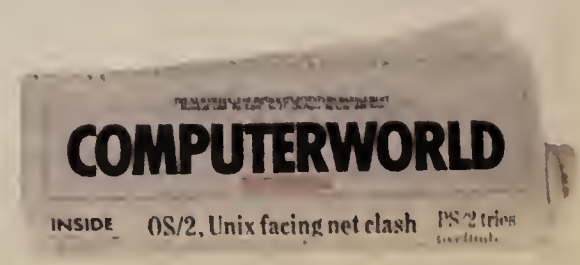


The Newspaper of IS

The more things change . . .

Client/server setups today have the same problems that plague time-share environments. But don't despair: You can plan around the situation.

James Endicott

BY JOHN E. GIRARD

Is it deja vu all over again?

Local-area network-based client/server computing has been touted as an important concept in the migration from traditional mainframe systems to a future of high-performance desktop computing. Unfortunately, many client/server systems being implemented today are not living up to expectations.

That's because despite all the hoopla about client/server computing, the first wave of implementations are mostly going in as time-share-type systems. Their architectures resemble scaled-down, traditional mainframe environments rather than true distributed powerhouses.

Basically, the client/server world as defined today is one in which personal computers on LANs are clients that receive programming data resources from a functionally and physically distinct system that plays the role of the server. The server typically ends up doing most of the client's work.

The net effect (pun intended) of handling an increasing number of users and complex client transactions is that the central server quickly becomes overloaded. That means some companies are experiencing the same time-sharing problems of downtime and slow processing they thought they would get rid of by moving to a small platform.

However, the realization that client/server systems are your enterprise's "little mainframes" doesn't have to be negative. Take a cue from what's good in centralized environments — thorough planning and management — to make the most of client/server as it exists today. A plan for spreading the work load between client and server according to the task at hand and an agenda for downtime are critical to making the current client/server environment viable.

To get value from client/server computing, you've got to use the system's resources, such as processors, disk storage, networks and so on, to greatest advantage. Efficient partitioning — dividing labor between clients and servers — helps you realize the full computational potential of your systems. Using a combination of the partitions helps spread the processing load, thereby minimizing downtime and ensuring adequate performance.

The following section describes suggested partitions (see chart page 84), including cases in which you may want a time-sharing setup. The way you partition the load should always be driven by the task at hand:

• **Partition 1.** There are cases in which a time-share or shared-logic setup makes sense. Namely, if your users run straightforward applications with character-based needs, if you need a high degree of security and if you want to keep your data processing resources centralized, you may choose to partition the labor so that all significant processing remains on the server.

The user's display is a dumb terminal controlled from the host, with the user's graphical user interfaces (GUI), applications and files residing completely on the server.

• **Partition 2.** The second partition is used by GUIs that operate over a network protocol. This is an option when you want to keep your data processing resources centralized and have a more sophisticated interface.

The most popular example of this kind of partitioning is the X Window System running on an X terminal. One portion of the GUI on the server converses with a portion on the client. An application designed to support the local handling of graphically oriented events maintains the user's display. All significant application processing, however, remains on the server.

But keep in mind that this partition demands a significant amount of server and network resources to operate a GUI over a network. The server must do a lot of client work, including providing virtual memory support and running more of the display portions of the user application.

If the server must do incidental tasks for the client, more traffic is sent on the network and more server processing and storage resources are consumed per client.

• **Partition 3.** This partition is used by self-contained workstation display environments

Continued on page 84

Girard is a senior systems analyst at the Advanced Network Computing Service of New Science Associates, Inc. in Mountain View, Calif.

• Partitioning the load helps

• Why client/server looks traditional

• Diskless workstation, X terminal worries

Continued from page 83

such as terminal emulators (e.g., a PC running the Datastorm Technologies, Inc. Procomm terminal emulator or an Apple Computer, Inc. Macintosh running the MicroPhone terminal emulator from Software Ventures Corp. or a complete implementation of X Window running on a workstation).

All significant application processing remains with the server, but the load on your network is smaller than that in Partition 2 because the client system can manage its own operating system and local display and storage resources.

This is a particularly important concern for X Window users. X Window, which demands large amounts of memory, runs best on full workstations (not X terminals — see story page 85), and the user gains the additional benefit of being able to run X Window applications locally on the workstation.

• **Partition 4.** This is the first opportunity for the user to divide application labor between the client and the server. The application is split apart. The portions that are best suited to run on the client are executed on the client, and the portions that are best suited to run on the server are executed on the server. Communications between the two parts of the application are achieved with a network communications protocol.

The most common example of this is the remote procedure call (RPC). When an application is split into pieces, the RPC is compiled into each piece. When a user attempts to run the split program, the RPC makes the pieces "network-aware"; that is, the pieces get in touch with one another over the network. The application functions as a single program during execution.

Distribution of processing between clients and servers is flexible, and you have the opportunity to tune resource sharing for maximum client benefit. Now that IBM is opening up access to Advanced Peer-to-Peer Networking, there will be more applications in this partition that enhance the ability to use traditional mainframes for client/server applications.

• **Partition 5.** This partition places the entire client application on the client. Client applications can perform their own local processing and at the same time exploit a database management system engine running on a server as an intelligent file access mechanism. A powerful DBMS such as SQL Server, Ingres or Oracle can perform sophisticated, server-based processing and multiuser access coordination at the client's request.

A scenario popularized by IBM that works at this partition is the High-Level Language Application Program Interface (HLLAPI). HLLAPI is a means by which a client application treats legacy screen-based mainframe applications as databases. The user gets an application with a single screen, but this application is coordinating mainframe log-ins and CICS and IMS transactions in the background.

• **Partition 6.** This partition will become increasingly important to applications developed in the 1990s. Database vendors are experimenting with RPC and remote data access mechanisms that allow databases to perform client/server interactions directly among themselves in addition to interactions with the user.

These database-to-database client/server operations will enhance information systems' ability to distribute databases across multiple systems and multiple sites and yet have coordinated, high-speed access for on-line transaction processing.

• **Partition 7.** This partition places all processing services on the client and leaves only file storage on the server. The client system is responsible for executing all application-related tasks.

Shared file service of this kind is exemplified by Apple's AppleShare, Sun Microsystems, Inc.'s Network File System, Novell, Inc.'s Universal File System and others. Shared file services are the electronic version of "Sneakernet."

This partition's use is simple. Both data and program files can be accessed by clients. However, this access will not speed up client processing; it will only extend your client's reach to larger file systems. The client's systems will operate only as fast as their own processors, operating systems and memory allow.

Neither will this partition help you with multiuser database access issues. For example, a database accessed at this partition is only a file system; there is no server-based engine to manage contentions when two or more users want to modify the same record.

Plan for emergencies

Partitioning is but one part of the planning that will help take advantage of client/server as it exists today. Because you may have to rely on the work of a central machine, contingency planning for downtime and preventative maintenance should be high on your priority list.

If you plan your ratio of clients to servers conservatively, you'll decrease the likelihood of overloading the system because you'll have spare capacity for growth in the number of users as well as the number of transaction loads.

The rule of thumb is that you want enough power not only to keep all your users on-line but also to ensure that they don't have to wait too long for their jobs to be completed.

Network monitoring tools that will track client, server and network activity can help you tune for maximum performance and suggest when it's time to increase your systems' capacities.

Spare equipment and service plans are important. Defining the budget for such contingency items is based on questions such as the following: How long can you afford to be without your LAN? How much work can you get done if the server is unavailable? How much rework will be needed when the LAN is restored? What is the cost of not doing business?

If your needs are so critical that you cannot afford any downtime, you may want to consider fault-tolerant options. The simplest fault-tolerant technique is disk mirroring, in which all data changed on the server is written redundantly to two disks. In the event of a server failure, the chances are good that at least one of the disks will be recoverable.

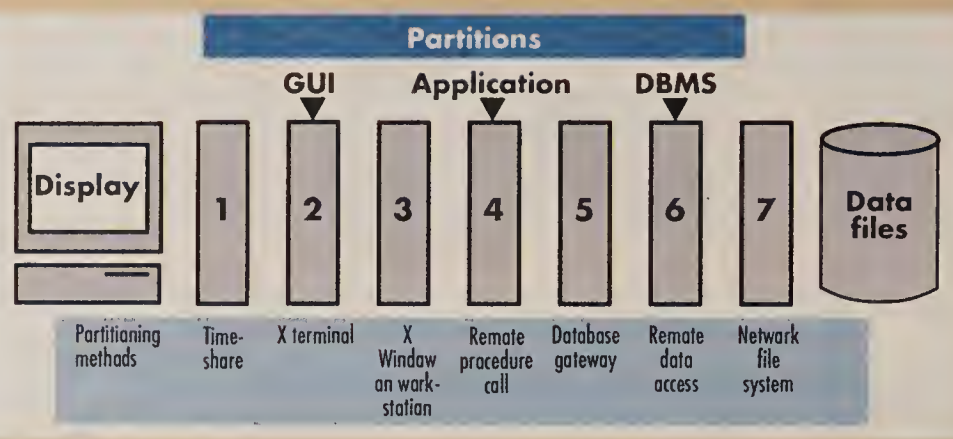
Disk mirroring options that operate within a server are available from IBM for high-end Personal System/2s and from Novell — System Fault Tolerance (SFT) II — for all NetWare servers. There are also disk controller cards appearing on the market that implement mirroring on a variety of platforms.

A more comprehensive way to eliminate downtime is to mirror an entire server. In the event that a server fails, the entire redundant system is on-line so that users stay up and running. Examples of products that can provide this capability include Trellis Mirroring from Trellis, Inc. and No*Stop network from Nonstop Networks Ltd. Novell is also working on SFT III to provide this feature within NetWare environments.

In some cases, multiprocessor systems such as Sequent Computer Systems, Inc.'s Unix file servers may be desirable because the redundancy in their multiprocessor, multi-I/O design can improve availability. For example, if a processor fails in a four-processor server, the system can be rebooted with three processors. There will be a reduction in performance, but the system stays on-line while you wait for replacement parts. •

Who's doing the work?

When partitioning labor between client and server, analyze the task first, then combine partitions to meet your needs



Source: New Science Associates, Inc.

CW Chart: Janell Genovese

Where client/server and time-share overlap

Feature	Traditional time-share	Client/Server
Common, shared data on a centralized server	Yes	Yes
Common, shared services (such as printing) on a centralized server	Yes	Yes
Low-cost servers	No	Yes
Server platform (cost per user)	Medium to high	Low to medium
Client platform (cost per user)	Low	Low to high
Customizable user interface	Difficult	Easy
User system shares processing load	No	Various options
Application response time	Server-dependent	Local processing is largely independent of server performance
Users can work with server off-line	No	Various options
Variety of off-the-shelf applications	Good	Excellent
Application (cost per user)	High	Low to medium

Source: John Girard

CW Chart: Janell Genovese

Easy for whom?

LAN-based client/server computing has begun to look traditional because users have accepted vendors' definition of the technology that closely resembles a centralized, hierarchical server/terminal architecture.

Such systems are easy for vendors to implement, and applications that are shared are easier to build and control. Data stays in one place, making maintenance, version control, development and security more manageable.

However, as time goes on, the number of client transactions rises as users take on more applications, and the complexity of client transactions increases. LAN database applications will require the presence of a centralized server database management system such as Microsoft Corp.'s SQL Server, which expends considerable resources managing data storage and programmatic search and retrieval requests from client programs.

In this way, the central server quickly becomes overloaded. The problem for users is that if the server goes down, they can't work. Nor can they leverage computing power on their desktops because nearly all the work takes place on the server.

New user workstations add to central server overload

The load on client/server setups that rely heavily on a central server can reach critical mass fast.

Complicating matters is the use of X terminal and diskless workstation technology to handle client/server applications. While these machines are cheaper than typical workstations and their maintenance tends to be simpler, they accelerate the burden on the server even faster than standard PCs.

X terminals are sophisticated graphics terminals without operating systems. In order to function, they must have extra support from servers to compensate for their lack of a local disk and a full operating system. Depending on the product, they might need boot support, virtual memory management over the network and windows manager support over the network.

This extra support is a drain on the servers beyond the resources needed to run user applications. X terminals increasingly offer built-in window managers and utility applications, but without a full operating system and local disk, their ability to host local applications remains limited.

Short on memory

X terminals are also hungry for memory to support their bit-mapped displays, a situation that is detrimental to application uptime. For example, if an X Window application bound to the X terminal calls for text fonts that are not built into it, several megabytes of font maps might be downloaded to the X terminal.

If an X Window application requires several downloaded fonts and multiple graphics illustrations, the X terminal can run out of memory, and the application will crash. To get around this situation, firms can add memory to the X terminal so that it can process more graphics and fonts without help from the server. Or they can allow the server to simulate virtual memory for the X terminal over the network.

While the former remedy decreases server loading by reducing the need for cross-network virtual memory management, font downloads and so on, it raises the cost of the X terminal. The latter remedy increases traffic on the network and demands more processing and storage resources from your server.

No matter how many ways you soup up your X terminals and servers, though, the chances are that no significant local processing will be possible if the server goes down. The best the user can hope for is to recover the session. Thus, X terminals cannot escape the most frustrating limitation of a time-share environment.

Diskless workstations are true workstations that run a full operating system but lack a local fixed disk. They have instructions in nonvolatile memory to enable them to boot from a disk on a file server. Diskless workstations have programming and graphical sophistication and are slightly cheaper to acquire and maintain than "disk-full" workstations.

The advantage diskless workstations have over X terminals is the ability to execute programs locally in their own memory, which in theory is at least as efficient as a disk-full workstation. But again, problems can occur in a client/server setup.

First, the user's workstation will be making periodic requests for system files and services contained on the server's disk — requests that would otherwise have been satisfied more efficiently if the workstation were disk-full and didn't have to rely on the network and server.

Second, diskless workstations are true workstations, which means they will need to access the server for more demanding purposes than X terminals. Diskless workstations require access to a full range of operating systems files and services and have greater virtual memory management requirements than does an X terminal.

Therefore, the diskless workstation will want to maintain disk files on the file server for paging memory and swapping processes. Access to support system files not directly related to the applications will continuously reserve file server resources that should have been available for application support.

In the case of a diskless Intel Corp. 80386-based workstation running Microsoft Corp.'s Windows, a swap file may be relatively small — say, 1M to 16M bytes. In the case of Unix, however, the page and swap file requirements could range from 10M to more than 90M bytes. Large or small, these requirements eat away at resources the file server is supposed to have ready for general use.

This resource pig-out multiplies with each new diskless client. And if the server becomes unavailable, local processing may be impossible.

X terminals and diskless workstations may be an appropriate investment if the applications demand sophisticated graphics and the client-to-server ratio is small. They may also be appropriate for larger client-to-server ratios if the graphics needs are simplistic.

Do not invest in X terminals or diskless workstations on the basis of an initial cost savings unless you are sure you'll be willing to abandon local processing capability for your desktops. •

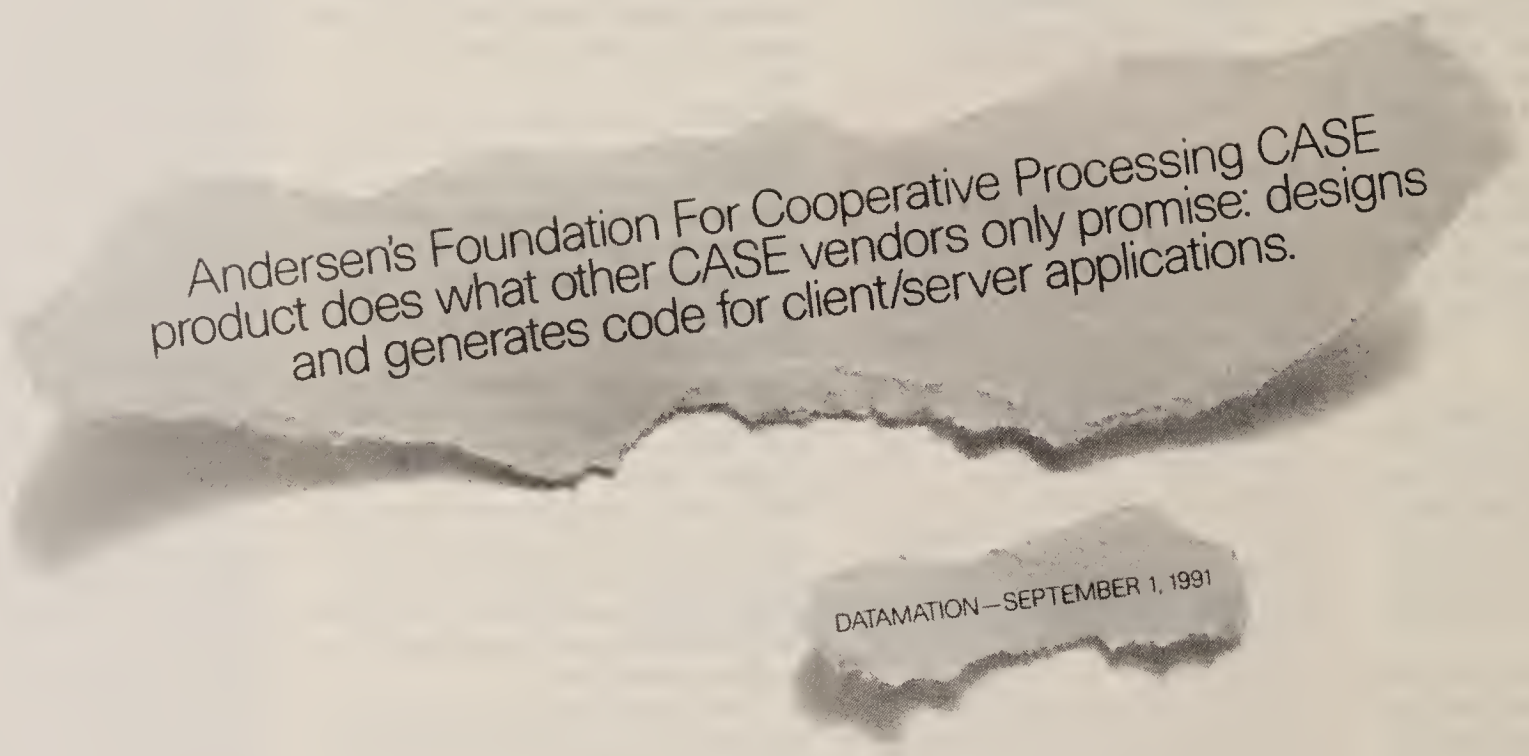
JOHN E. GIRARD

USE SCENARIO
X terminal

A company buys a Unix server and gives its employees X terminals and a graphical desktop publishing system. Because of the extensive graphical requirements of the application, the X terminals don't function well until they receive generous memory upgrades. At this point, they have cost as much as low-end workstations. Because the graphical application also requires extensive processing resources from the server, only a third of the users can go on-line at one time. The Unix server is scaled up with additional processors and memory, but the number of users that can use the product effectively is still less than half because the X terminals require more bandwidth than the existing network can supply. Ultimately, the company ends up replacing some of the X terminals with full workstations and builds a new, unplanned-for network.

USE SCENARIO
Diskless

A company purchases a PC as a server to support 150 service representatives logging a high volume of calls. The company has committed to a relational database that runs in DOS. It has also committed to running Windows, even though the database is not available in a Windows version. Users are put on diskless PCs, which are slightly cheaper to buy and maintain than "disk-full" workstations. What happens with Windows is that when the system is placed on-line, Windows consumes a sizable chunk of network bandwidth by accessing large files and swapping space on the server. Another chunk is claimed by the user database sessions, which also build and swap work files on the server. As the users run increasingly complex database queries, the server eventually runs low on disk space and processing capacity to support all the file demands from the diskless workstations. Response time cannot support call volume. To minimize swapping over the network, the company upgrades memory on the diskless PCs and ultimately adds hard disks for a substantial secondary cost.



Considering how much has been written about CASE tools for cooperative processing, we thought you would appreciate an executive summary.

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MANAGER'S JOURNAL

EXECUTIVE TRACK

Edward B. Parrish, formerly director of information systems at Sun Co. in Radnor, Pa., has been hired as a vice president at **The Executive Insight Group, Inc.**, an IS management consultancy in Bryn Mawr, Pa. His principal areas of focus are electronic data interchange (EDI), technology and architecture, strategic planning and organization assessment.

At Sun, Parrish was active in the American Petroleum Institute's information technology activities and was a co-founder of the Petroleum Industry Data Exchange, which focuses on EDI implementation in that industry. He was Sun's director of technology and planning before becoming director of IS.

Parrish holds a bachelor's degree from the University of Illinois and a master's degree from Carnegie Mellon University, both in chemical engineering.

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Brian L. Vautaw has been promoted to vice president of information technology at **Vickers, Inc.** in Troy, Mich. Vickers, a unit of Trinova Corp., manufactures and markets power and motion control components and systems.

As vice president, Vautaw is responsible for the use of IS in all functional areas, including engineering, manufacturing, sales and finance.

Vautaw joined Vickers in 1987 and has been director of information services since 1989.

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James H. Knowles, formerly senior operating officer at Salomon Brothers, Inc., has been named president of the applications development division at **Network Management, Inc.** (NMI), a Fairfax, Va.-based provider of network management services.

Knowles is one of several former Salomon colleagues lured to NMI by former Salomon IS chief Francis A. Dramis, chairman of NMI. Dramis also worked with Knowles at AT&T.

Knowles is a graduate of the MIT Industrial Management School.

Little comfort for vendors here

Hickory White keeps Unix suppliers hopping with rigorous open systems criteria

BY MARYFRAN JOHNSON
CW STAFF

On the wood-paneled wall of MIS director Pat Thomas' office at the Hickory White furniture manufacturer hangs this quote from the late President Calvin Coolidge: "Persistence and determination alone are omnipotent."

How loudly these stark words must ring in the ears of the major computer vendors dealing with the very determined Thomas as he steers the $60 million High Point, N.C.-based firm through a grueling conversion from proprietary to open systems.

During the conversion, under way for 18 months now, Thomas has created a challenging and unusual process for winnowing out the best Unix vendors.

"I do believe in open systems, and I intend to leverage all of my vendors so that this company wins," the 47-year-old manager says. "I want to be in a position to use the most powerful tool here: the pneumatic jack. If I don't like what I'm running, that's the hardware I'm going to use to haul it right out of here."

At an estimated cost of $270,000, the company's three-phase transition to Unix-based hardware and software (see story page 89) is meant to quicken responsiveness to customers, streamline internal processes and improve overall communication. The company's total annual information systems budget is about $360,000.

"We're much larger than a ma-and-pa shop, but we're not NASA or the U.S. Department of Labor," Thomas notes. "We want certain things for our company, and we're pretty much fed up with being locked into proprietary systems and software and not having the freedom to choose what we need."

Roger Ball

Hickory White's Thomas *says persistence pays off in transition from proprietary to open systems*

To win Hickory White's business, the first obstacle vendors had to hurdle was a homemade benchmark test — by all accounts, the Mother of All Benchmarks. Requiring more than a gigabyte of disk space, nearly 12 hours to set up and another three hours to run, the benchmark painstakingly duplicated the company's mainframe production environment, which now runs on an old Burroughs Corp. (now Unisys Corp.) machine.

"With this benchmark, everyone had to measure and run the same way, whatever their hardware configurations were," Thomas says. "If you're moving into the Unix world, and you don't try it out with your own programs and database, you can make a big financial mistake."

Out of 10 major vendors offered the chance to compete — including IBM, Digital Equipment Corp. and Hewlett-Packard Co. — the only three to make the finals were Sun Microsystems, Inc., Sequent Computer Systems, Inc. and Data General Corp.

"We paid the price physically in sheer lack of sleep, but we learned what worked well, what was elegantly

Continued on page 89

Beware of 'automation complacency'

BY MITCH BETTS
CW STAFF

Thanks to "fly-by-wire" automation, there is usually nothing for airline pilots to do between taking off in San Francisco and landing in Hong Kong. Does artificial intelligence make the pilots less alert to potential problems along the way?

The answer is yes, according to Raja Parasuraman, a psychology professor at The Catholic University of America in Washington, D.C. His experiments with college students and pilots demonstrated that the more accurate the computer-guided system, the less vigilant the operator.

"Automation breeds complacency," he said.

The problem is not limited to aircraft. Overreliance on AI can affect the performance of a wide variety of workers, including medical technicians and operators of chemical plants and nuclear power stations.

Automation complacency can creep in any time computers are automatically monitoring the status of complex activities, Parasuraman said. "Most software is very reliable, so people trust it. But it's not 100% reliable. When it does fail, they tend to miss the event, whatever it may be, because they don't monitor the raw sensor data that is routinely fed to the computer," he said.

Later this year, Parasuraman plans to develop a profile of the type of person most likely to develop automation complacency. But Peter G. Neumann, a computer scientist at SRI International in Menlo Park, Calif., said he doubts that such a personality profile would be of much use.

Neumann agreed that automation complacency is a serious problem when the computer takes over mission-critical or life-critical operations, but he said, "Everybody is prone to it."

During the last 10 years, 5% of the potentially dangerous incidents that pilots voluntarily reported to NASA's Aviation Safety Reporting System were attributed to automation complacency.

To combat the problem, Parasuraman recommended that pilots and other workers who use high-tech monitoring systems should intermittently perform tasks usually done by computer so that they can remain alert and practice their manual skills.

He also advocated greater emphasis on manual flight skills during pilot training.

BOOK REVIEWS

A shot in the arm for work teams

Partners not Competitors: The Age of Teamwork and Technology
By Lawrence M. Oliva
Idea Group Publishing, $32.95

Work teams: The concept is hyped as the management trend for the lean 1990s, although many U.S. companies have used the approach for 20 years or longer. But it isn't all hype. With technology advances allowing members to work closely together — even when they're in different locales — teams make more sense than ever before.

The team approach to work means that groups of workers (that is, those with hands-on experience) help make decisions collectively and focus their own work efforts. The problems caused by this approach are that it may take years to fully implement. Furthermore, middle managers may actually discourage the team concept for fear of being displaced.

Oliva, an operations program manager at Sun Microsystems, Inc., says those drawbacks should not prevent companies from looking at the viability of teams, though.

Partners not Competitors starts slowly. The text relies heavily on statistics and studies to prove what many already know: American businesses need to take a hard look at their long-term survivability rather than focus all of their efforts on stockholder-pleasing quarter-by-quarter gains.

Oliva takes to task government and management policies that have helped turn the U.S. away from its industrial/manufacturing roots to a nation that today has a negative trade balance for manufactured goods. He says no modern society can depend totally on others to produce its machines, tools and appliances.

That's where information systems can help. Technology allows for close communication among team members and various teams working together. As time-based competition becomes a more significant factor in the success or failure of a product, IS can help to shorten the product's time to market.

The past decade has seen a shift away from stable, high-volume production rates and standardized customer service to an age when customers have come to expect customized products and services. Teamwork, Oliva says, can help businesses meet those expectations.

McGraw-Hill Guide to Effective Communications for MIS Professionals
By Larry M. Singer
McGraw-Hill Book Co., $34.95

IS professionals have emerged from the data center to play a more prominent role in how their companies are run. But not all have mastered the communications skills needed to rub shoulders with other top executives.

Singer, a 20-year IS veteran and current Ross Laboratories employee, says if IS workers want to be effective managers and corporate players, they need to be effective communicators as well. His book offers practical guidelines on topics such as how to create logical project development documents, run effective meetings and create readable and accurate user manuals.

The author provides a variety of devices to guide the reader through the book — from checklists of what should be included in a requirements document, to sample project reporting forms and presentation outlines, to a simple list of what IS meetings should encompass.

At 261 pages, the Guide isn't exactly light reading. However, well-organized chapters and a detailed contents outline help the busy reader easily find areas of interest and relevance.

21st Century Manufacturing: Creating Winning Business Performance
By Thomas G. Gunn
HarperBusiness, $28.00

It's a given that technology alone can't turn a sloppy manufacturing operation around. But when technology, sound business practices and dedicated staff are brought together, a world-class organization is achievable.

Gunn, a former Unisys manufacturing executive and consultant for Ernst & Young, backs his theories with advice and real examples.

He shows the reader how to evaluate an organization's productivity and the risks it faces. Then he offers a series of change-drivers to help turn an organization around — including the use of technology.

The chapter on using IS as a competitive weapon does not tell IS professionals a whole lot that they don't already know. Instead, the value of this book for IS lies in making clear to them their role in the manufacturing organization as well as the kinds of challenges their companies face.

Reviews compiled by Alan J. Ryan, associate editor, features.

Hickory White keeps Unix suppliers hopping

CONTINUED FROM PAGE 87

implemented and what was Rube Goldberg, spit and baling wire," Thomas says of the three-month benchmarking process.

The company best suited to replace Hickory White's mainframe was Sun, with its 630MP multiprocessing server. But it was more than raw speed in the database-intensive benchmark that snagged it for Sun, Thomas stresses. Just as important was the vendor's ability to pass Thomas' next test: a 14-point list of service and support requirements.

"I was really benchmarking the vendor more than the machine," he says. "You have to just keep asking and asking questions, and the one left standing is the one you do business with."

Thorough criteria

Thomas' questions covered everything from user training, maintenance and leasing requirements to the cost of future expansions of disk, memory and processors. Absolute adherence to AT&T's Unix System V Release 4 (SVR4) operating system and strict compliance with the System V Interface Definition (SVID) were critical points that eliminated several vendors whose own Unix versions strayed from the standard.

"Why SVR4? Because it is the only one that is a tested, certifiable, multivendor industry standard," Thomas says firmly. "My advice is to avoid any additional hooks in the operating system to implement some particular software package. You pay the price later, when things don't work together," he adds.

His favorite trick for weeding out nonstandard Unix products is to call up on-line text Help, enter the manual command and then scroll to the end of the documentation. "You should see a registered trademark at the bottom that says exactly what release level of AT&T compliance it is certified for," he says. "We programmed to the SVR4 and SVID standards, and our software environment will not work right with SVR2 or some older standard. Some of the newer functions are flat-out not supported."

Another key point on Thomas' list was that the vendor be willing to join in partnership with Hickory White for on-site maintenance through a subcontractor that currently tends to the Burroughs environment.

"Pat is probably more demanding in some of the things he wanted, but when it really came right down to it, he worked with us on a lot of things," says Will Shook, vice president of sales at Strategic Technologies, Inc. in Cary, N.C., the Sun value-added reseller that provided the 630MP server.

"The whole user community continues to get more sophisticated," Shook adds. "But I hope not everyone is quite as intensive as this. I need some meat on my bones at the end of this decade!"

Given the chance to do it all again, Thomas says he would also carefully test software products before writing any checks. "The only way I would acquire software would be to have it installed, running and certified as the exactly correct patch release to run with the other software I'm using," he says.

Must plug and play

Thomas also warns his IS colleagues to beware of the "techie guru" mind-set that still exists at some Unix companies — that is, the notion that users will relish the chance to tinker with software that turns out to be buggy.

"We are a commercial site. We don't have time for that kind of crap," Thomas says. "We need updated manuals and accurate documentation, and it's got to work today — right out of the box."

Despite the stumbling blocks, however, Thomas is unshaken in his faith that an open computing environment based on true standards is clearly the path to the future.

"The software accessibility and communications network capabilities are two of the strongest reasons for moving to open systems," he says. "There is no technology today that can touch the connectivity of Unix."

High tech comes to the furniture field

Within a 150-mile radius of High Point, N.C., which calls itself "The Furniture Capital of the World," some 85% of the world's furniture is manufactured at companies such as U.S. Furniture Industries, Drexel Heritage Furnishings, Inc., Henredon Furniture Industry and Hickory White.

Yet furniture companies have historically taken a dim view of high tech, considering it "a necessary evil, at best," says Pat Thomas, MIS director at Hickory White.

That attitude has changed markedly during the past five years, however, as larger corporations have bought up the conservative, family-owned businesses that once dominated the field.

When Hickory White's new president, Randy Austin, arrived on the job three months ago, one of his first questions was why the company's 24 salesmen had no portable computers, Thomas recalls. The short answer: They will, soon.

The corporate environment today includes 32 users and four additional network nodes at Hickory White's other manufacturing divisions around the state. The aging, proprietary Burroughs-centered environment is hobbled by five different operating systems, 11 styles of keyboards, five programming languages and four different databases.

"It drives us nuts," Thomas says on behalf of his four-person staff. "We can only do development on nights or weekends."

The first step in Hickory White's open systems conversion is moving the Burroughs mainframe software and DMS2 database to AT&T Unix System V Release 4 running on a Sun 630MP server.

For a development environment to port the mainframe software to Unix, the company chose Intel Corp. I486-based PCs running The Santa Cruz Operation's (SCO) Open Desktop operating system, which bundles in a database from The Ask Cos. and other software tools.

Phase 2 entails moving the accounting software from old Convergent Technologies, Inc. PCs to either Unix or MS-DOS — a decision to be made in the next several weeks.

Phase 3 will involve integrating the manufacturing software, already running on PCs under SCO Unix in a package from Production Software Ltd.

The new environment should be fired up and working by the end of this year.

"This will shorten our response time in the customer service area, and I'm looking forward to that," Austin notes. "The other thing this system will enable is having our sales force tap into the database through modems and get information more quickly."

MARYFRAN JOHNSON

CALENDAR

MAY 17-23

Internatianal Baale & Babbage User Graup Canference. Dallas, May 17-19 — Contact: Boole & Babbage, Inc., Sunnyvale, Calif. (408) 735-9550.

Fifth Annual Carparate EFT/Financial EDi Canference. Chicago, May 17-20 — Contact: Kenan-Flager Business School, Chapel Hill, N.C. (919) 962-9630.

VIP '92 Legent Users Canference. Orlando, Fla., May 17-21 — Contact: Legent Corp., Pittsburgh, Pa. (412) 442-1284.

ICA 1992 Expa and Canference. Atlanta, May 17-21 — Contact: ICA Expo '92 Housing Coordinator, Rogal America, Inc., Newton, Mass. (617) 965-8000.

Midwest Electranics Expa. Minneapolis, May 18-21 — Contact: Leslie Tolworthy, Miller Freeman Expositions, Dallas, Texas. (214) 239-3060.

Interap '92. Washington, D.C., May 18-22 — Contact: Interop '92 Spring, Washington, D.C. (415) 941-3399.

Infarmatian Engineering Sympasium. Washington, D.C., May 19-21 — Contact: Wilma A. Hurwitz, Technology Transfer Institute, Santa Monica, Calif. (310) 394-8305.

Phliadelphia Camputer Canference & Expasitian. Philadelphia, May 20-21 — Contact: Sylvia Griffiths, National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

Exhibitian and Briefings on Customs Automatian. New York, May 20-21 — Contact: American Association of Exporters and Importers, New York, N.Y. (212) 944-2230.

Cellular Digital Packet Data Technical Canference. Santa Clara, Calif., May 22 — Contact: Shelley Julien, (800) 933-2228.

MAY 31-JUNE 6

Asian Technalagy Raundtable Exhibitian. Sapporo, Japan, May 31-June 2 — Contact: Dasar, Inc., Palo Alto, Calif. (415) 321-5544.

Ungermann-Bass Customers and Partners. Reston, Va., May 31-June 3 — Contact: Sandy Hollywood, Ungermann-Bass, Inc., Santa Clara, Calif. (408) 562-7994.

Bariand Internatianal, Inc. Database Canference. Palm Desert, Calif., May 31-June 6 — Contact: CT Meeting Planners, Monroe, Conn. (203) 452-5388.

Candie Perfarmance Canference. Los Angeles, June 1-3 — Contact: Candle Corp., Los Angeles, Calif. (310) 207-1400.

Applied Machine Vision Canference & Tabletap Exhibits. Atlanta, June 1-4 — Contact: Lisa Moody, Society of Manufacturing Engineers, Dearborn, Mich. (313) 271-1500, Ext. 385.

Pen Expa, The Pen-Based Camputing Canference & Shawcase. Santa Clara, Calif., June 1-4 — Contact: Pen Expo, Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-4200.

Portable Camputing and Cammunicatian Canference. Los Angeles, June 2-3 — Contact: Richard Horan, Laptop Expositions, New York, N.Y. (212) 682-7968.

SGML — The Management Issues. San Francisco, June 4-5 — Contact: Graphic Communications Association, Alexandria, Va. (703) 519-8160.

The Infarmatian Warehause. San Francisco, June 4-5 — Contact: The Information Warehouse Registration, St. Louis, Mo. (314) 935-5380.

JUNE 7-13

Facus '92. Denver, June 8-12 — Contact: Marissa Gotta, J. D. Edwards & Co., Denver, Colo. (303) 488-4663.

Creating and Maintaining Custamer-Facused Organizatians. New York, June 9-10 — Contact: The Conference Board, Inc., New York, N.Y. (212) 339-0290.

Autadesk Expa '92. Dallas, June 9-11 — Contact: Autodesk, Inc., Sausalito, Calif. (415) 332-2344.

Self Maintenance Users Canference. Minneapolis, June 9-11 — Contact: Dataserv, Eden Prairie, Minn. (612) 829-6226.

LatusWarld. Boston, June 9-11 — Contact: Jan Collins, Brodeur & Partners, Inc., Waltham, Mass. (617) 894-0003.

VantageExpa '92. Bedford, Mass., June 10-11 — Contact: Imaging Technology, Inc., Bedford, Mass. (617) 275-2700.

JUNE 14-20

LOMA Partnership Canference. Chicago, June 14-17 — Contact: Donna Dilbeck, Life Office Management Association, Meetings Department, Atlanta, Ga. (404) 951-1770.

JUNE 28-JULY 4

Database Warld. Boston, June 29-July 1 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

JULY 5-11

Infarmix Waridwide Users Canference. San Jose, Calif., July 8-10 — Contact: Jaye Prosser, Informix Public Relations Group, Menlo Park, Calif. (415) 926-6316.

IS Financial Management Annual Canference. San Francisco, July 8-10 — Contact: Terence Quinlan, Financial Management for Data Processing, San Francisco, Calif. (415) 731-3706.

JULY 19-25

QuarkXPress Users Canference. New York, July 22-23 — Contact: QUI, Salem, N.H. (603) 898-2822.

JULY 26-AUG. 1

The Managing Enterprise Netwarks Canference. Boston, July 27-29 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

PC/Canada. Toronto, July 28-30 — Contact: The Interface Group, Needham, Mass. (617) 449-8938.

AUG. 2-8

Fed Micra '92. Washington, D.C., Aug. 5-6 — Contact: Sylvia Griffiths, National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

Fase CD-ROM and Multimedia Canference & Expasitian. Washington, D.C., Aug. 5-6 — Contact: Sylvia Griffiths, National Trade Productions, Alexandria, Va. (703) 683-8500.

AUG. 23-29

Auta-Tech. Detroit. Aug. 25-27 — Contact: Automotive Industry Action Group, Southfield, Mich. (313) 358-3570.

New job titles, functions abound in market

BY ALICE LAPLANTE
SPECIAL TO CW

You can't operate a quick-response, business-oriented and highly distributed support function based on outmoded job descriptions. And as businesses undergo radical and rapid change — expanding their range of operations and pushing authority further down the ladder — new kinds of jobs are emerging in information systems and communications.

Given the current trend toward downsizing to distributed client/server architectures, it's not surprising that some of the hottest new IS job titles involve expertise with desktop technology, networking or a combination of the two.

Local-area network expertise is highly prized, and some of the fastest growing job categories involve installation and administration of these networks.

If general knowledge is good, specialized knowledge is even better. Richard Wonder, national director of recruiting at New York's Robert Half International, Inc., notes that he's been seeing a lot of requests for certified Novell, Inc. engineers, as well as LAN and wide-area network specialists.

And as many U.S. firms expand operations overseas, there is an especially high demand for international telecommunications specialists, says Steve Fogle, a partner at the Alexander Group, a San Francisco-based executive search firm that focuses on IS.

Systems administrators specializing in Unix workstations also represent a rapidly emerging job category as companies explore open systems. "Unix workstations are not a simple device, and when a department has 50 of them linked together on a network running mission-critical business applications, there is a need for a full-time systems administrator to handle the support requirements of those systems," Wonder says.

Higher salaries, too

In the programming/applications developer job categories, new specialists are also emerging. Wonder says clients are starting to request graphical user interface (GUI) specialists — workers who are adept at designing GUIs for a specific hardware platform or operating system environment.

The title "Windows programmer" is also a particularly common request these days, Wonder says, adding that such positions command a 10% to 20% salary premium over other programmers.

Another title that's being sought with increasing demand is object-oriented programmer, according to Jack Baroudi, undergraduate director of the IS department at the Stern School of Business at New York University. He says the demand for object-oriented programmers who have experience in C++ and the Unix environment is especially strong — so strong, in fact, that the school has added courses in those subjects for undergraduate students.

Many firms are also recruiting workers for the position of "emerging technology specialist," according to Jim Wetherbe, professor and director of the MIS Research Center at The University of Minnesota's Carlson School of Management in Minneapolis.

"These people do a technology transfer as appropriate, when a project in the company requires their expertise" Wetherbe says. In effect, such people become "virtual team members," joining projects for a time and then moving on to share their knowledge with another group in another department, he says.

Many companies that are moving aggressively into distributed systems are also starting to think hard about the need for careful architectural planning and developmental control. This is giving rise to some new kinds of jobs involving quality assurance and infrastructure planning.

Suzanne Hall, president of HS Group, Inc. in Dallas, an IS job placement and consulting firm, says she has noticed the expansion of the role of quality assurance and test analysts in applications development groups — particularly those involved in developing applications for distributed or client/server environments. "There is an awareness that someone has to check all these development efforts on all these platforms very carefully," she says.

Ivan Brass proves Hall's point. Brass joined Simon & Schuster, Inc. at the beginning of this year as the company's first vice president of system quality and practices. A key part of Brass' job at the Old Tappan, N.J.-based publishing company is to ensure a higher level of consistency of application development across all platforms.

"Creating this job was a recognition that in a distributed environment too much can fall between the cracks," he says.

Meeting new needs

Robert Fox, managing director of IS at the American Automobile Association (AAA) in Lake Mary, Fla., created a new position — systems architect — about a year ago to help AAA make the transition away from traditional systems development work.

"We felt it would be important to have people who focused on figuring out the most appropriate platform for each piece of a distributed application," Fox says.

One problem Fox had trying to find candidates for the newly created position, he says, was that no one knew what it was, and the response to the advertisement AAA placed in various publications was not large.

But those who glossed over the unfamiliar job title of "systems architect" are missing out "on a deep area of new technology," Fox says, adding that the position offers the opportunity for advancement to the high-level position of director of systems planning and integration.

There's a lesson here for job seekers: Don't assume that just because a job title is unfamiliar, it isn't worth pursuing. You might just be passing up a great opportunity.

LaPlante is a free-lance writer based in Palo Alto, Calif.

INDUSTRY CURRENTS

Keeping an eye on inventory pays

Efficient professionals to improve companies' logistics in high demand

BY EMILY LEINFUSS
SPECIAL TO CW

The recession may be putting a damper on job opportunities in many areas of information systems, but there are some places where hard times have actually made IS more critical and jobs more plentiful. This is certainly true in parts of the manufacturing and distribution pipeline.

The process of moving products from the raw-material stage through the distribution of the finished product is undergoing a transition from both a technology and a functionality perspective, creating a tremendous challenge for IS professionals, says John Borelli, vice president of computer-integrated manufacturing at the Gartner Group, Inc., a research and consulting firm in Stamford, Conn.

In terms of technology, the change is from host-based systems to client/server and from character-based applications to graphical user interfaces, he says. In terms of functionality, systems up and down the pipeline are becoming more intertwined and more interactive. In the modern world of manufacturing/distribution, logistics boundaries are permeable and transactions are in real time.

These changes are creating job opportunities at forward-thinking companies as well as at the consulting firms that assist those companies, says Tom Kubiak, president of employment firm Halbrecht & Co. in Old Greenwich, Conn. "Those functional areas are critical to big companies right now, and there are major applications development efforts under way," he says.

Kubiak says he is currently recruiting in this function area for Fortune 1,000 companies, including pharmaceutical firms and consumer products companies. Consulting firms are also looking for skilled IS people in these function areas, he says.

"We see a demand for internal consultants who can offer approaches to improving distribution and logistics — people who have computer savvy but also have advanced quantitative degrees in operations research or mathematics or statistics," Kubiak adds.

Customer needs

A key to logistics is understanding the relationship to the customer. According to Thomas Nickles, vice president at consulting firm CSC Index, Inc. in Cambridge, Mass., "The IS role is to determine how to service the customers — including service levels, taking orders, customer satisfaction and movement of the product to the customer."

Companies are looking for efficiencies everywhere along the chain, from suppliers to customers: implementing new technologies, integrating information flows and establishing more direct communications links. These efforts are, in turn, creating a demand for skilled IS professionals.

The kind of help that businesses are looking for in inventory and distribution requires familiarity with telecommunications technologies, says Frank Caccamo, manager of the Management Systems Division of Procter & Gamble Co. in Cincinnati.

In addition, candidates should be familiar with image processing for collecting and distributing information as well as electronic data interchange for transfer of information, Nickles says. The technologies that enhance the collecting and communicating of information are the most important, he says.

Understanding your customers' needs and being able to translate how to fulfill those needs through IS is a key skill set for career success.

That is because a primary task in the logistics of tracking products from the raw-material stage through the distribution of the final product is to link the systems of all the parties concerned, from the manufacturer to the packager to the wholesale distributor to the retail stores that ultimately sell the products.

Somebody with a good understanding of the process of making that link and a good mix of functional skills would never be out of work, says Frederick Crawford, a consultant at Cleveland Consulting Associates in Cleveland.

For both inventory and distribution, image processing and bar-code scanning technology are becoming prevalent. For managing the logistics of tracking inventory through its distribution, there is an increase in shrink-wrapped applications that can help follow the movement and transportation of products. And for inventory, distribution and logistics combined, there is movement toward relational databases that can respond to the real-time needs of the flow of products from one stage to the next.

"More and more companies have become aware that carrying inventory is expensive, as is not having enough [inventory]," says Glen Gray, assistant director of systems at American Home Products in New York.

Inventory control has a very high priority and is the last area that would suffer because of economic hard times, Gray adds.

Because of this emphasis on the economics of inventory, IS professionals need to acquire knowledge of just-in-time inventory methods, according to Robert Rouse, assistant dean of the School of Technology and Information Management at Washington University.

Griff Manahan, business information manager at Black & Decker Corp. in Townson, Md., says he is "attempting to understand our customers' needs and fulfill those needs better than we have in the past. We are cutting down on cycle time and providing them with much better inventory timing." The high cost of mismanaged inventory is a significant factor behind the increasing use of IS in the industry.

Manahan says that this shift toward focusing on customer and business needs has altered job functions at Black & Decker. "Job titles are changing from the traditional project leader and programmer analysts to systems manager and business analyst," he says.

This title change reflects the context of the job's moving from a behind-the-scenes technician to one who understands the business of shipping products through a warehouse and the needs of the customer, he adds.

> INVENTORY CONTROL has a very high priority and is the last area that would suffer because of economic hard times.

Manahan says IS people who are knowledgeable in inventory and distribution can become managers of distribution facilities or logistics functions. "IS staffs will actually break from the traditional DP and as they get closer to the user group — opposed to a central IS group — they will start to look to the user organization for career opportunities," he says.

An IS executive who has such prior experience, is aware of the technology out there and has the analytical skills expected of a systems professional can go far, Kubiak adds.

Leinfuss is a free-lance writer based in Sarasota, Fla.

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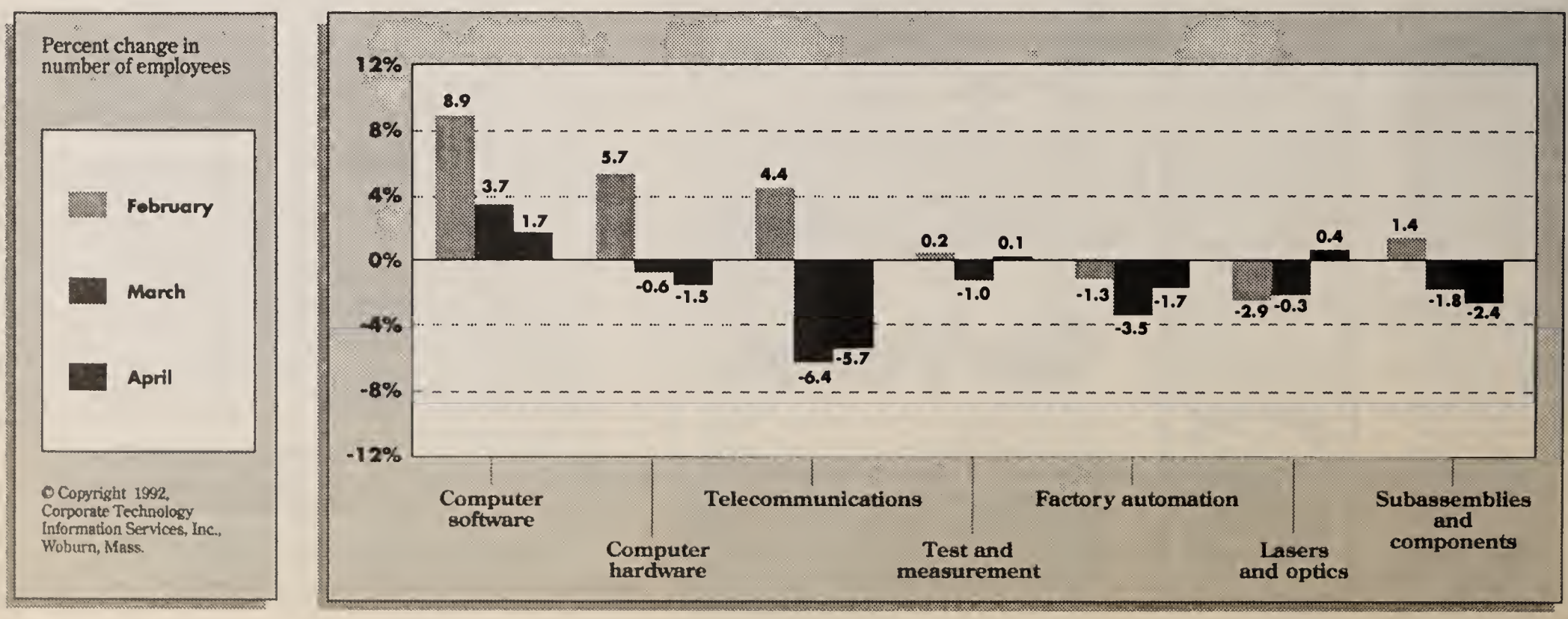

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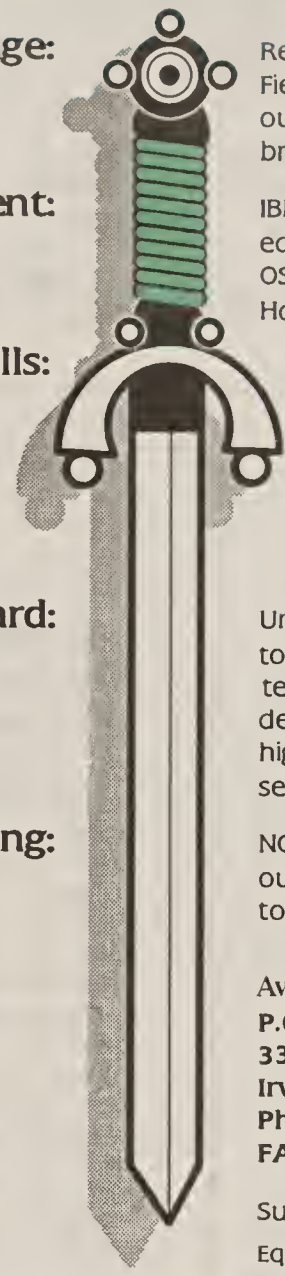

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"Our clients - banks, insurance firms, pharmaceutical and chemical companies, and software developers - typically require seasoned professionals with unique, hard-to-find skill sets. However, professionals with a minimum of three years' experience in specific technical areas are often few and far between. To fully satisfy our clients' objectives, I need to target an audience with very technical expertise. With its highly qualified readership, *Computerworld* is crucial in helping us make that match.

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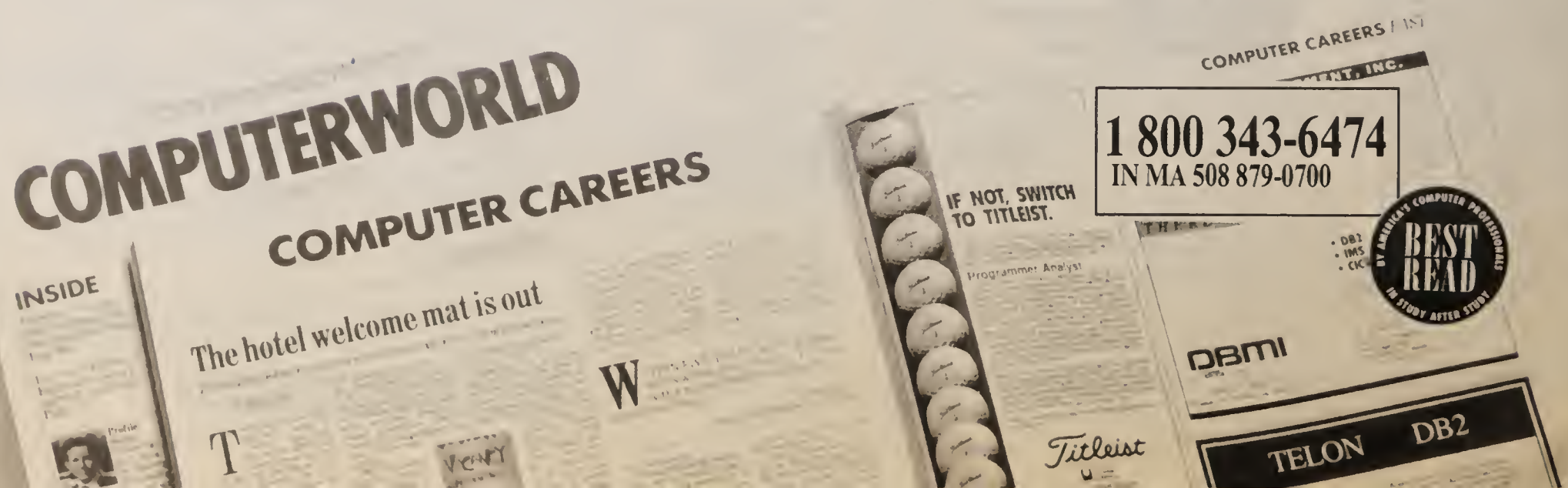

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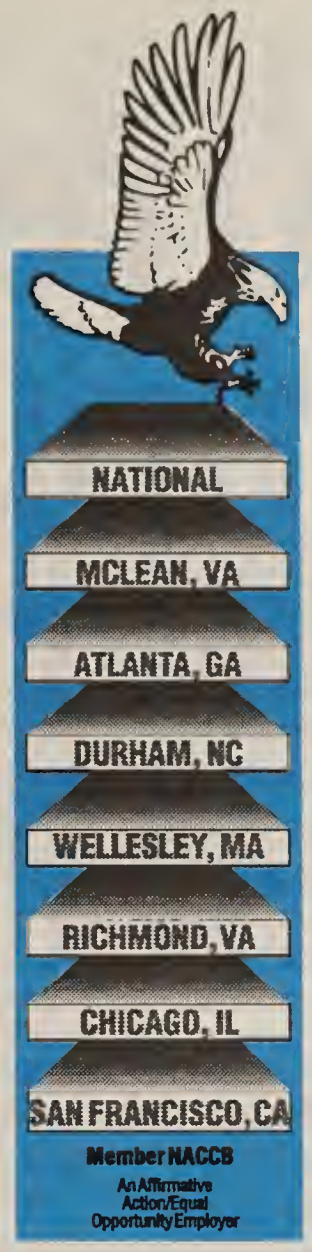

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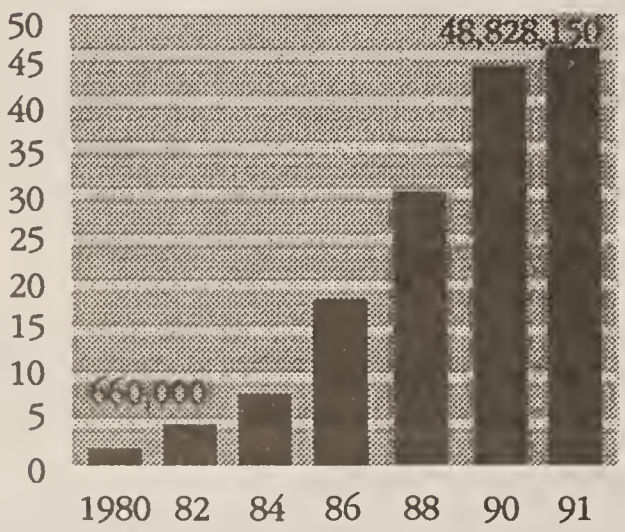

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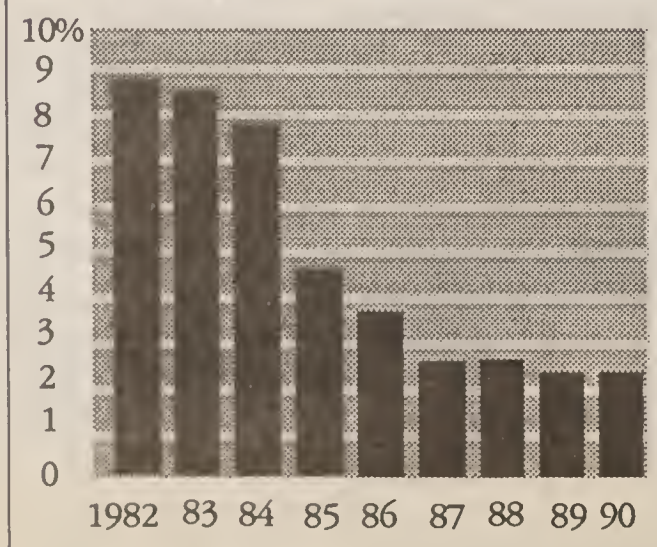

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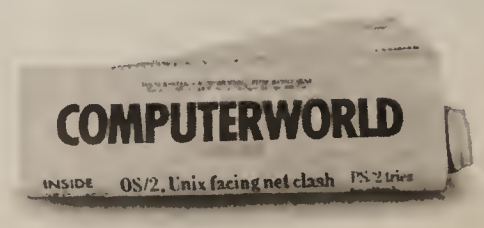

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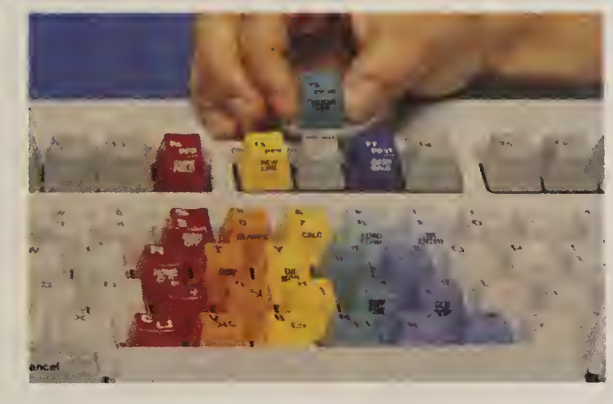

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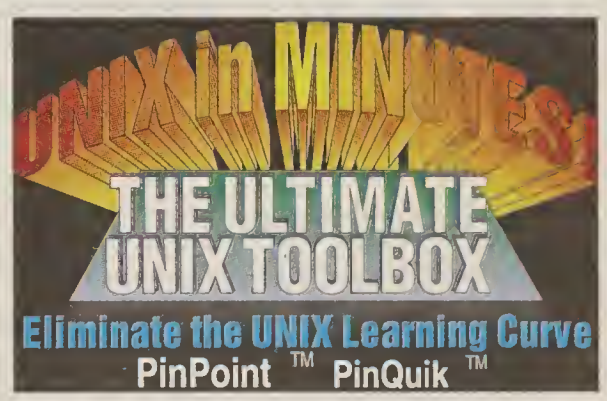

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MARKETPLACE

Large monitors: Choosing right

BY MEL MANDELL
SPECIAL TO CW

While most users have always taken whatever monitor came standard with their personal computers, more are beginning to want the benefits of a larger monitor.

Starting at 15 inches, large screen monitors offer higher resolutions, sharper images and are less subject to flicker. But they can be expensive — some 20-in. color monitors may cost more than the latest 486-based PCs.

Leonard Steinbach, manager of the Information Center at the Health Sciences Center of the State University of New York in Brooklyn, for example, does not settle for bundled monitors. Instead, he carefully matches the monitor to the task.

Employees who spend a lot of time at their PC get the biggest. For example, users working with Microsoft Corp.'s Windows-based software and word processing packages get 15-in., high-resolution — 1,024- by 768-pixel — monitors. For desktop publishing or demonstrations, 17-in. or larger monitors are standard.

When considering an upgrade to a larger monitor, a user should look at the following factors:

•**Suppliers.** Choosing a monitor without buying the system can be time-consuming. There are hundreds of vendors and products to choose from. Suppliers range from PC vendors — such as Dell Computer Corp., IBM and Mitsubishi Electronics America, Inc. — to specialized monitor makers — such as Nanao USA Corp. in Torrance, Calif., and Radius, Inc. in San Jose, Calif.

•**Price.** For less than $400, users can get a 15-in. monitor with 800- by 600-pixel resolution or better. As the price goes up, so does graphics quality, character size, clarity and display room. Top-end systems with high resolution, 20-in.-plus monitors can cost $4,000 or more.

High price barriers may prevent some users from upgrading, however. At Tacoma, Wash.-based Weyerhaeuser Corp., users who spend hours at their monitors get the best as long as their budgets can cover the pricey acquisition, says Barry Wilbur, information systems project manager.

One product that tips the scales is Nanao's 20-in. T660I, which lists for $3,999, although discounts are available.

•**Resolution.** Standard office applications require at least an IBM Video Graphics Array, 640- by 480-pixel resolution monitor. If running Microsoft's Windows or a graphics package, consider moving to a Super VGA monitor. Higher resolutions, such as 1,280 by 1,024 pixels, are available from vendors such as Nanao with its FlexScan T560I and T660I.

•**Interlaced vs. noninterlaced.** Shop for a noninterlaced monitor that scans every line of pixels on every cycle, rather than every other line. The refresh rate should also be no less than 60Hz; however, 70Hz and above is common. Both will cut down on screen flicker.

•**Graphics cards.** If using applications beyond the 640- by 480-pixel resolution, a fast graphics board is almost a necessity. Most boards support noninterlaced scanning at resolutions up to 1,024 by 768 pixels and provide a 70Hz to 72Hz refresh rate. Prices range from $100 to $800.

•**Color vs. monochrome.** Not everyone needs color. Big-screen monochrome monitors cost half as much as color, are good enough for text-only applications and are widely available. For example, a high-resolution, 19-in. VPX1000 monochrome monitor from Moniterm Corp. in Minnetonka, Minn., costs $395. In contrast, a comparable color monitor, the Model HJ-6985 from Mitsubishi, sells for about $795.

•**Maintenance.** Fortunately, monitor maintenance is not a burning issue: Most monitors have a six- to eight-year life span. The high-voltage power supply is most likely to fail, but it can be easily and cheaply replaced.

•**Warranties.** Most problems are covered by extended warranties, which typically last one to two years. After the warranty expires, some companies farm service out to local shops. For example, Elf Atochem North America, Inc., a chemical producer in Philadelphia, services its 1,000 PCs, including monitors, through contracts with local service vendors, says Guy Nelson, director of network services. Local service is cheaper and more convenient for multiple sites, he says.

•**View.** Some users may like other, more exotic features. For instance, some monitors, such as the 15-in. Pivot from Radius, can be turned 90 degrees from "landscape" to "portrait" mode. Glare-reducing screens are also available. More common requests are tilt-and-swivel bases or etched screens. But be forewarned: The latter can reduce image sharpness, says Carl Machover, president of Machover Associates Corp., a graphics consultancy in White Plains, N.Y.

•**Size.** Remember, big screens take up space. A 16-in. monitor is more than 1-ft deep; a 20-in. monitor takes up a minimum of 2 sq ft. To save space, accessories that suspend the monitors above a desk are available, but they cost about $200.

Mandell is a free-lance technical writer based in New York.

Health hazards

Though most experts say they doubt there is any risk from the radiation emitted from monitors, some users and employers are sufficiently concerned to make low emissions a requirement.

Monitor manufacturers are responding by meeting the demanding MPR II standards for low emissions promulgated by the Swedish government.

As a result, low-emission monitors should eventually become the standard in corporate America, although legislative efforts to require them have been rebuffed, especially by the city of San Francisco and Suffolk County, N.Y.

Products that measure emissions include the Tracer from Shield Corp. in Eugene, Ore., which is priced at $425 to $800, and the VDT/VLF Radiation Survey Meter, Model HI-3603 from Holaday Industries, Inc. in Eden Prairie, Minn. The meter is priced at $1,145.

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The BoCoEx index on used computers

Closing prices report for the week ending April 24, 1992

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AT Model 099	$400	$525	$150
AT Model 239	$550	$650	$175
AT Model 339	$600	$700	$250
PS/2 Model 30 286	$650	$900	$300
PS/2 Model 60	$700	$900	$325
PS/2 Model 80	$2,050	$2,100	$1,100
PS/2 Model 90	$4,300	$4,600	$3,300
Compaq Portable II	$450	$500	$375
Portable 286	$600	$800	$250
Portable 386	$2,000	$2,125	$1,000
SLT 286	$700	$900	$400
LTE 286	$900	$1,100	$500
Deskpro 286E	$600	$1,000	$325
Deskpro 386/20	$1,800	$2,000	$1,100
Apple Macintosh Plus	$600	$750	$475
SE	$850	$1,050	$650
IIX	$2,800	$3,250	$2,000
IICI	$3,300	$3,600	$2,460
IIFX	$4,200	$4,900	$3,700

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STOCK TRADING INDEX

Industry Almanac

RECOMMENDATION CHANGES

UPGRADED FROM HOLD TO BUY: **Silicon Graphics, Inc.** (Prudential Securities, Inc.). A recent downgrade to hold was based on uncertainties surrounding Silicon Graphics' (SGI) proposed buyout of **Mips Computer Systems, Inc.** (MIPS): Mips' recent disastrous quarterly report announced revenue of about half the $42.3 million expected. However, in light of the reduced offer that Silicon Graphics has tendered — cutting the value of the deal in half, to about $208 million — negative issues have been somewhat alleviated.

Silicon Graphics' third-quarter earnings report was a minor disappointment. While earnings per share, at 22 cents, were basically in line with expectations, revenue was $184 million, as opposed to estimates of $192 million.

DOWNGRADED FROM STRONG BUY TO BUY: **Conner Peripherals, Inc.** (Bear, Stearns & Co.). Conner (CNR) remains in an excellent position, riding the crest of a first quarter that exceeded analysts' expectations with better gross margins, lower expenses and higher revenue. Most of the growth came from the 3½-in. drive sector, which represented about 70% of revenue. The surge came from increased demand for personal computers. The earnings per share estimate for 1992 has been raised from $1.70 to $2 and from $2.30 to $2.50 for 1993.

A recent issuance of $345 million in convertible debt has given Conner $950 million in cash. However, its debt-to-capital ratio has increased from 34% in December to 49%, as a result.

UPGRADED FROM BUY TO STRONG BUY: **American Management Systems, Inc.** (Alex. Brown & Sons, Inc.). First-quarter earnings that outperformed earnings per share estimates by 29% as well as revenue of $75.7 million, up 9.2%, have spurred a positive outlook. Two key target sectors showed a strong uptick in revenue. The federal government segment increased 50% on the strength of a $20 million contract with the Saudi Arabian Air Defense Command, and financial services revenue jumped to $13.2 million.

With the company poised to sign five or six major contracts in the telecommunications segment, the earnings per share estimate has been raised from 23 cents to 30 cents.

CAROL HILDEBRAND

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, MAY 1, 1992

TOP PERCENT GAINERS

Spinnaker Software	26.67
Quarterdeck Office Sys.	23.64
Network General	16.67
Go Video	16.67
Exabyte	16.34
Egghead Discount Software	16.28
Tandon Corp. (L)	15.74
Autodesk Inc.	14.29

TOP PERCENT LOSERS

Knowledgeware Inc.	-17.24
Printronix Inc.	-16.67
AI Corp.	-15.38
Gandalf Technologies Inc.	-15.00
Compaq Computer Corp.*	-13.89
Hogan Systems Inc.	-12.82
Newbridge Networks Corp.	-11.63
Everex Systems Inc.	-11.32

TOP DOLLAR GAINERS

Exabyte	5.25
Informix Corp. (H)	4.25
Autodesk Inc.	4.25
Adobe Systems Inc. (L)	3.75
Egghead Discount Software	3.50
Policy Management Sys.	3.38
Quarterdeck Office Sys.	3.25
Synoptics Communications	2.75

TOP DOLLAR LOSERS

BMC Software Inc.	-5.75
Compaq Computer Corp.*	-3.75
Xerox Corp.	-3.38
Cabletron Systems	-3.13
Easel Corp.	-3.00
Knowledgeware Inc.	-2.50
Wellfleet Communications	-2.25
Northern Telecom Ltd.*	-2.13

Exch	52-Week	Range		May 1 Close	Wk Net Change	Wk Pct Change
Communications and Network Services						**Up 1.81%**
OTC	15.00	6.75	3 COM Corp.*	11.00	0.13	1.15
NYS	65.75	55.75	American Info Techs Corp.*	63.25	0.88	1.40
NYS	44.00	32.88	AT&T* (H)	43.25	0.00	0.00
OTC	4.25	1.25	Artel Communication Corp.	1.38	0.00	0.00
NYS	50.63	40.25	Bell Atlantic Corp.	44.38	0.50	1.14
NYS	52.63	43.38	Bellsouth Corp.	49.00	0.63	1.29
NYS	9.38	4.75	Bolt, Beranek & Newman	5.75	0.63	12.20
NYS	65.88	30.25	Cabletron Systems	49.13	-3.13	-5.98
OTC	31.00	11.75	Chipcom Corp.	21.75	-1.75	-7.45
OTC	43.63	13.88	Cisco Systems Inc.	36.88	0.38	1.03
OTC	35.25	13.75	Compression Labs Inc.	19.75	0.50	2.60
OTC	4.63	1.50	Data Switch Corp.	1.56	-0.19	-10.69
NYS	23.63	12.38	Digital Comm. Assoc.*	18.75	0.13	0.67
OTC	19.00	8.50	Digital Systems Int'l Inc.	11.25	-1.00	-8.16
OTC	8.88	3.63	DSC Communications	4.81	0.56	13.25
OTC	10.88	5.00	Fibronix Int'l Inc.	6.25	0.00	0.00
OTC	37.50	13.50	Filenet Corp.	25.75	2.13	8.99
OTC	3.63	1.13	Gandalf Technologies Inc.	2.13	-0.38	-15.00
OTC	2.50	1.19	Gateway Communications	1.69	0.19	12.53
NYS	5.50	2.13	General Datacomm Inds.	3.88	0.00	0.00
ASE	5.88	0.50	Go Video	3.50	0.50	16.67
NYS	35.00	28.13	GTE Corp.*	32.88	0.63	1.94
NYS	70.63	50.00	ITT Corp.	64.13	0.63	0.98
OTC	36.13	25.25	MCI Communications Corp.	33.13	-0.38	-1.12
OTC	14.50	5.75	Microcom Inc.	10.75	1.25	13.16
NYS	18.25	7.88	Network Equipment Tech.*	14.38	0.75	5.50
OTC	25.50	6.75	Network General	19.25	2.75	16.67
OTC	20.00	8.75	Network Systems Corp. (L)	10.25	0.63	6.49
OTC	17.88	5.50	Newbridge Networks Corp.	14.25	-1.88	-11.63
NYS	49.25	35.50	Northern Telecom Ltd.*	40.88	-2.13	-4.94
OTC	65.00	22.63	Novell Inc.*	54.00	1.25	2.37
NYS	82.38	68.00	Nynex Corp.*	77.13	1.75	2.32
OTC	37.50	16.50	Octel Communications Corp.	23.50	0.25	1.08
OTC	9.88	5.63	Penril Data Comm. Ntwks.	6.50	0.00	0.00
OTC	53.00	20.50	Picturetel Corp.	37.00	1.50	4.23
OTC	18.75	9.75	Proteon Inc.	12.13	0.38	3.19
NYS	19.75	11.63	Scientific Atlanta Inc.	16.50	0.50	3.13
NYS	66.00	49.00	Southwestern Bell Corp.	62.38	-0.25	-0.40
NYS	31.50	20.75	Sprint Corp.	24.00	-0.25	-1.03
OTC	42.25	14.25	Synoptics Communications	22.75	2.75	13.75
NYS	38.88	32.88	US West Inc.	35.88	0.25	0.70
OTC	41.25	21.25	Wellfleet Communications	34.50	-2.25	-6.12
PC / Workstations						**Up 0.03%**
OTC	15.75	5.75	Advanced Logic Research (L)	7.00	0.75	12.00
OTC	70.00	40.25	Apple Computer Inc.*	59.25	2.75	4.87
OTC	32.25	14.50	AST Research Inc.*	16.63	0.38	2.31
NYS	19.25	10.13	Commodore Int'l	12.13	-1.38	-10.19
NYS	52.00	22.13	Compaq Computer Corp.*	23.25	-3.75	-13.89
OTC	28.63	13.50	Dell Computer Corp.	25.50	-0.50	-1.92
OTC	7.75	3.00	Everex Systems Inc.	5.88	-0.75	-11.32
NYS	34.00	21.25	Harris Corp.	28.75	0.25	0.88
NYS	85.00	44.63	Hewlett-Packard Co.*	79.88	1.38	1.75
OTC	18.63	7.75	Mips Computer Systems (L)	8.25	0.25	3.13
NYS	29.75	13.25	Silicon Graphics	16.88	0.50	3.05
OTC	38.00	20.75	Sun Microsystems Inc.*	28.00	1.00	3.70
NYS	34.38	23.38	Tandy Corp.*	27.88	-1.00	-3.46
NYS	11.13	5.13	Zenith Electronics	7.50	0.13	1.69
OTC	25.50	9.00	Zeos International Ltd. (L)	10.25	0.75	7.89
Large Systems						**Up 0.91%**
ASE	20.63	11.63	Amdahl Corp.*	17.00	0.50	3.03
NYS	12.75	7.50	Control Data Corp.	12.00	0.38	3.23
NYS	19.25	8.88	Convex Computer	9.50	-0.75	-7.32
OTC	19.63	3.50	Cray Computer	3.50	-0.38	-9.68
NYS	52.25	31.50	Cray Research Inc.*	37.50	2.00	5.63
NYS	22.50	8.00	Data General Corp.	9.25	0.38	4.23
NYS	71.75	44.00	Digital Equipment Corp.*	46.00	0.13	0.27
NYS	107.38	81.63	IBM*	90.75	2.63	2.98
NYS	128.00	93.50	Matsushita Electronics	106.50	2.50	2.40
OTC	26.25	10.75	Pyramid Technology	10.75	-1.25	-10.42
OTC	17.88	7.50	Sequent Computer Sys.	11.63	-0.25	-2.11
OTC	18.38	10.13	Sequoia Systems Inc.	15.13	0.88	6.14
NYS	54.25	27.25	Stratus Computer Inc.*	46.38	-1.13	-2.37
NYS	17.63	9.50	Tandem Computers Inc.*	13.88	1.25	9.90
OTC	3.88	1.13	Tandon Corp. (L)	1.38	0.19	15.74
NYS	11.75	3.25	Unisys Corp.*	10.50	0.00	0.00
ASE	7.50	2.00	Wang Labs Inc. (b)*	3.75	-0.25	-6.25
Software & DP Services						**Up 0.12%**
OTC	68.50	37.50	Adobe Systems Inc. (L)	43.50	3.75	9.43
OTC	13.25	3.50	AI Corp.	6.88	-1.25	-15.38
OTC	54.50	19.25	Aldus Corp. (L)	20.50	-0.38	-1.80
OTC	19.75	10.13	American Software Inc.	16.00	0.38	2.40
OTC	20.00	7.50	Ask Computer Systems	15.13	0.25	1.68
OTC	62.25	23.25	Autodesk Inc.	34.00	4.25	14.29
OTC	37.75	13.00	Bachman Info. Systems (L)	14.00	0.25	1.82
OTC	42.50	25.88	BGS Systems Inc.	36.25	0.00	0.00
OTC	79.00	33.00	BMC Software Inc.	51.75	-5.75	-10.00
OTC	20.50	8.75	Boole & Babbage	19.00	1.00	5.56
OTC	86.75	39.50	Borland Int'l Inc.*	47.75	-1.00	-2.05
OTC	11.25	4.75	CE Software	5.25	0.00	0.00
ASE	13.75	6.50	Cheyenne Software Inc.	11.63	-0.25	-2.11
OTC	20.38	7.50	Cognos Inc.	7.88	-0.38	-4.55
Semiconductors						**Up 1.20%**
NYS	21.50	8.38	Advanced Micro Devices	16.88	1.88	12.50
NYS	11.50	7.00	Analog Devices Inc.	10.50	0.88	9.09
OTC	18.88	6.75	Atmel Corp.	8.25	-0.63	-7.04
OTC	14.13	7.00	Chips and Technologies	8.00	-0.13	-1.54
NYS	24.50	9.25	Cypress Semiconductor Corp	9.25	-0.88	-8.64
NYS	10.38	6.25	Dallas Semiconductor	7.50	-0.25	-3.23
OTC	68.75	38.50	Intel Corp.*	52.63	0.88	1.69
NYS	11.13	6.38	LSI Logic Corp. (L)	6.88	0.38	5.77
NYS	22.38	10.88	Micron Technology	14.00	0.38	2.75
NYS	82.50	54.00	Motorola Inc.*	79.88	0.75	0.95
NYS	11.50	3.88	National Semiconductor*	9.75	1.00	11.43
OTC	27.00	13.00	Sierra Semiconductor	17.75	1.25	7.58
NYS	40.88	26.00	Texas Instruments*	34.13	-0.63	-1.80
OTC	11.00	5.88	VLSI Technology	7.00	-0.63	-8.20
OTC	14.25	3.75	Weitek	4.00	-0.50	-11.11
ASE	5.25	2.00	Western Digital Corp.	4.25	0.13	3.03
OTC	32.50	19.25	Xilinx	26.13	0.88	3.47
OTC	11.50	4.25	Zilog Inc.	8.00	0.38	4.92
Peripherals and Subsystems						**Up 0.30%**
OTC	2.50	1.00	Apertus Technologies	1.81	0.19	11.57
OTC	10.00	2.75	Archive Corp.	9.13	0.25	2.82
OTC	24.00	11.25	Banctec Inc.	21.25	-1.00	-4.49
OTC	23.50	4.88	Cambex Corp.	12.50	-0.63	-4.76
ASE	13.88	7.00	Cognitronics Corp.	13.50	0.00	0.00
NYS	24.38	12.50	Conner Peripherals*	20.50	2.13	11.56
ASE	19.66	3.25	Dataram Corp.	14.00	1.50	12.00
NYS	16.88	4.88	EMC Corp.	12.88	0.38	3.00
OTC	9.50	4.75	Emulex Corp.	7.88	0.13	1.61
OTC	23.00	14.75	Evans & Sutherland	17.00	0.00	0.00
OTC	40.63	13.38	Exabyte	37.38	5.25	16.34
OTC	27.25	14.75	Intelligent Info. Systems	22.88	-1.63	-6.63
OTC	11.25	4.00	Iomega Corp.	8.25	0.38	4.76
OTC	34.75	14.50	IPL Systems Inc.	21.00	-1.25	-5.62
OTC	24.50	11.75	Komag Inc.	14.25	-0.50	-3.39
OTC	13.25	1.63	Maxtor Corp.* (H)	12.50	-0.63	-4.76
OTC	15.63	5.50	Micropolis Corp.	9.63	-0.38	-3.75
NYS	98.75	83.50	3M Co.	92.75	0.13	0.13
OTC	9.25	3.50	Printronix Inc.	5.00	-1.00	-16.67
NYS	26.75	9.50	QMS Inc. (L)	9.88	-0.13	-1.25
OTC	18.00	8.88	Quantum Corp.	14.25	-1.00	-6.56
OTC	12.25	5.00	Radius Inc.	10.00	0.50	5.26
NYS	12.88	5.88	Recognition Equipment	9.00	-0.50	-5.26
OTC	12.50	5.38	Rexon Inc.	10.50	0.00	0.00
OTC	16.50	7.13	Seagate Technology*	15.63	0.88	5.93
NYS	78.00	34.75	Storage Technology*	45.38	-0.88	-1.89
NYS	30.88	16.00	Tektronix Inc.	18.88	0.50	2.72
NYS	82.25	51.50	Xerox Corp.	74.50	-3.38	-4.33
Services						**Up 0.56%**
OTC	28.25	16.25	American Mgmt. Systems*	22.75	-0.50	-2.15
NYS	5.38	2.88	Anacomp Inc.	4.13	-0.25	-5.71
OTC	19.00	12.00	Analysts Int'l	18.00	0.25	1.41
NYS	49.00	29.50	Auto Data Processing*	45.88	0.25	0.55
NYS	25.94	12.75	Comdisco Inc.* (L)	13.75	0.63	4.76
OTC	13.50	7.75	Computer Horizons	11.50	-0.50	-4.17
NYS	84.88	52.25	Computer Sciences*	68.63	-0.50	-0.72
NYS	10.13	7.00	Computer Task Group	9.38	0.00	0.00
OTC	19.25	7.75	Corporate Software	13.88	0.38	2.78
OTC	30.75	12.75	Egghead Discount Software	25.00	3.50	16.28
NYS	33.06	22.94	General Motors E (EDS)*	28.38	0.50	1.79
OTC	30.38	8.88	Intelligent Electronics	11.75	0.50	4.44
OTC	14.88	2.50	Merisel	10.63	-0.50	-4.49
OTC	15.75	5.75	Microage Inc.	10.25	-1.00	-8.89
OTC	41.25	20.25	Paychex	37.00	1.00	2.78
NYS	73.00	45.25	Policy Management Sys.	68.13	3.38	5.21
NYS	42.00	19.63	Reynolds and Reynolds (H)	42.00	1.50	3.70
OTC	32.00	21.25	SEI Corp.	27.38	0.63	2.34
OTC	24.38	17.00	Shared Medical Systems	19.00	0.13	0.66
OTC	24.88	13.50	Sungard Data Systems	22.50	-0.50	-2.17
NYS	6.13	1.13	Ultimate Corp.	1.75	-0.13	-6.67

KEY: (H) = New annual high reached in period (L) = New annual low reached in week

* Companies tracked in Computerworld Stock Index

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IN BRIEF

Borland posts loss

■ **Borland International, Inc.** last week disclosed a fiscal fourth-quarter net loss of $26.9 million, which included a $30 million restructuring charge related to the acquisition of Ashton-Tate Corp. Borland earned $2.7 million for the same period last year. Revenue for the quarter was $116 million, off 14% from last year's comparable period. Borland attributed its revenue decline to the pooling of interest accounting from the Ashton-Tate acquisition; its lack of a Microsoft Corp. Windows spreadsheet and database products; and a freeze in database purchase decisions. . . . **Electronic Data Systems Corp.** posted first-quarter net earnings of $133.1 million, up 9% from restated profits totaled in the corresponding period last year. Revenue increased 31% to $1.99 billion. . . . **KnowledgeWare, Inc.** reported fiscal third-quarter profits of $1.3 million, cutting its nine-month loss to $2 million. Revenue for the period was $26.8 million, off 13% from the same period last year.

■ **Systematics Information Services, Inc.** in Little Rock, Ark., has acquired an equity interest in **Treasury Services Corp.**, a Santa Monica, Calif., developer of information management systems for financial institutions. The two will market and develop systems for measuring profitability and managing risk of business units.

■ **Versant Object Technology, Inc.** in Menlo Park, Calif., last week received $3 million in financing from Atlas Venture.

■ **Mayfield Fund**, a venture capital partnership, has raised $4 million to fund start-up software firms. The firm is targeting entrepreneurs requiring between $50,000 and $500,000.

IBM chief confronts critical shareholders

Despite a poor fiscal 1991, Akers says his job is secure — and the board of directors is behind him

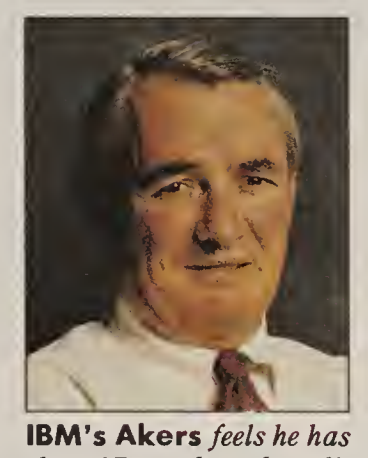
BY JEAN S. BOZMAN
CW STAFF

DENVER — IBM Chairman John F. Akers shook off criticism of his stewardship at last week's annual shareholders' meeting here, asserting that he has the complete support of IBM's board of directors despite the company's dismal fiscal 1991, in which it posted a whopping $2.8 billion loss.

Akers' longevity at IBM has been a hot topic lately as the industry leader inches its way through a gut-wrenching restructuring resulting in tens of thousands of rank-and-file workers taking early retirement and the departure of numerous top executives.

Harry Methner, president of a 4,000-member chapter of the National Association of Investment Clubs in the Denver area, asked Akers the one question on the minds of many IBM investors and watchers: How low would IBM's fortunes have to fall before its board would "have the stamina, the guts and the audacity to come to you and say, 'Mr. Akers, it's time to move on.' "

"I feel that I have their unanimous support," Akers said, referring to IBM's 17-member board. "In fact, I know I do."



IBM's Akers *feels he has the 17-member board's 'unanimous support'*

But Akers did not dismiss outright the possibility that future slides in IBM's $64.8 billion business might displace him before his expected retirement at age 60 in 1995. "If the business doesn't progress as we expect it to, and if the IBM board felt that the business would be better served by having someone else lead it," he said, "they would take that step."

In all, the 1,600 meeting attendees supported the IBM board's proposals and rejected independent stockholder proposals to add three lower level IBM employees to the board, require board directors to hold at least 1,000 shares of IBM stock and stop selling IBM products in South Africa.

The two-hour meeting covered many subjects, including the future of the mainframe, alliances with other vendors and the segmentation of IBM's business units.

Revenue to come

Akers said IBM plans to have $3 billion in OEM revenue in 1993 from sales of its disk drive and other component products to outside vendors, a jump from the $1 billion projected for 1992. He said he wants the firm to produce an 18% return on equity by 1995, up from 1990's 14.8% return.

IBM said it expects to reduce overhead costs through alliances with other vendors.

"We will focus on strategic opportunities — oversee our portfolio of businesses, exploit new growth opportunities and invest or divest — to maximize IBM's financial results," Akers said.

Compaq exits ACE, posts dismal quarterly revenue

BY CAROL HILDEBRAND
CW STAFF

HOUSTON — Compaq Computer Corp. last week sent a double-barreled signal that its business metamorphosis is not finished, announcing both drab first-quarter financials and its withdrawal from the Advanced Computing Environment (ACE) initiative.

Compaq's first-quarter net income of $45 million shows a 60% decrease from the $114 million in profits the company reported in the same period in 1991. Sales dipped 19%, from $971 million in the comparable quarter last year to $783 million.

Despite the slippage, Giancarlo Bissone, vice president of corporate marketing, was guardedly optimistic. "Results were lower than last year, but I believe we're on track in putting in place actions that will allow us to be successful," he said, citing cost controls and forthcoming new products as examples.

Placing the blame

Bissone acknowledged that unit shipments were down slightly year-to-year, but blamed that on a shortage of parts. Demand was up for the same period, he said. Bissone said he expects operating costs to increase in the next two quarters as the company launches major product and advertising blitzes.

Compaq's financial results reflect its continuing struggle to cut expenses in reaction to a viciously cost-competitive personal computer market.

"While the new products that have been rolled out are more competitive, [the products] haven't really started to kick in," said Richard Zwetchkenbaum, an analyst at Framingham, Mass.-based International Data Corp. "Compaq's got a lot of building to do, and it can't do it overnight."

The restructuring also includes using the Intel Corp. microprocessor as the company's sole platform, a decision that spurred Compaq to leave ACE, a consortium that aims to build workstations based on Mips Computer Systems, Inc.'s reduced instruction set computing (RISC)-based chips.

Doug Pushard, Unix systems manager at Compaq, cited two reasons behind the firm's decision to leave ACE: The accelerated introduction schedule of Intel's next-generation processor, the so-called P5, which is slated to appear at summer's end; and the porting of most major Unix software to the Intel platform.

"ACE is changing — it's more Mips- and less Intel-oriented," Pushard said. He added that Compaq had shelved all plans to introduce RISC-based products.

ACE on the shelf

Compaq's withdrawal from ACE pushed The Santa Cruz Operation to suspend development of Open Desktop on the Mips platform, said Jim Wilt, vice president of business development. "To the extent that ACE equals Mips, yes, we are putting ACE work on hold," he said.

Other ACE members were less sanguine about the consortium's prospects. "I don't think [Compaq's exodus] makes any difference. There are so many members," noted Digital Equipment Corp. Chairman Kenneth H. Olsen.

"We should be looking at which of these chips [Mips, Intel and DEC's Alpha] is going to give the best price/performance, rather than the politics" of the situation, said Microsoft Corp. Chief Executive Officer Bill Gates.

Staff writer Christopher Lindquist contributed to this report.

Deflated deal

As Compaq was withdrawing from ACE, Silicon Graphics, Inc. was reducing its purchase offer for Mips Computer Systems, whose RISC chip is integral to the consortium's future.

The reduced terms, combined with recent declines in both Mips' and Silicon Graphics' stock prices, cut the value of the proposed acquisition in half to $208 million.

Silicon Graphics' bid to pay less for Mips may be tied to Compaq's decision not to build a workstation based on Mips' RISC chip, analysts said.

Compaq was expected to be among the largest manufacturers of ACE-compliant systems, they added.

Under Silicon Graphics' latest proposal, the new terms call for each share of Mips common stock to be exchanged for 0.52 shares of Silicon Graphics', an offer 15% lower than the original exchange rate [CW, March 16]. The deal is slated to close next month.

Mips, which lost $34.7 million in fiscal 1991, dripped $12.7 million worth of red ink in the quarter ended March 31 — double the amount analysts said they expected. Silicon Graphics, in contrast, earned $12 million in the quarter.

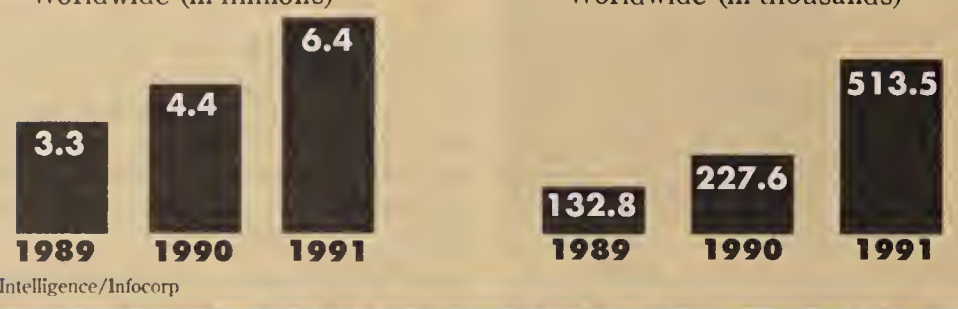
TRENDS

Macintosh MARKET

There's no doubt about the Macintosh's popularity, as buyers continue to invest in both software and hardware, but connectivity also remains a hot issue

Networking abounds

Helped in part by Apple's System 7.0, the Macintosh is increasingly becoming part of corporatewide networks, with a noticeable 56% rise since 1990



Source: Computer Intelligence/Infocorp

Fewer graphics, more spreadsheets?

Buyers continue to spend more on document-processing software than any other application area for the Macintosh; however, spreadsheet use is on the rise

Initial value[1] (in millions)

	1990	1991*
Document processing	$150.5	$186.1
Business graphics	$88.2	$101.4
Spreadsheet	$73.3	$145.1
Information retrieval	$35.4	$44.3
Multifunction	$30.2	$43.7
Accounting	$17.4	$28.6
Project management	$9.1	$12.6

Source: Computer Intelligence/Infocorp

[1] dollar value spent

High-end machines

Facing intense competition from RISC vendors, Apple continues to make inroads into the enterprise computing market with high-power desktop machines

Shipments (worldwide)

	1990	1991	1992*	1993*
Mac IIFX	30,000	70,000	**	**
Quadra 900	—	4,000	40,000	20,000
Tower 050 (or fast 040)	—	—	—	35,000
Power PC	—	—	—	4,000
Total	30,000	74,000	40,000	59,000

Source: "The Hartsook Letter"

* estimated
** IIFX price drops to midrange

CW Chart: Janell Genovese

NEXT WEEK

The paths to creating an open company are numerous — and bumpy. Some information systems execs are building open environments themselves. Others, such as **Paul Ricker** at G. Heileman Brewing Co., are employing a feisty new breed of integrator specialist. For tips, tales and talk of open systems, see Integration Strategies.

Skot Weidemann

Laptop users just love their machines to death — until they have to try to integrate them into the desktop environment. In Depth describes the basics for a system environment in which laptop users can keep track of information, share data with desktop and laptop users and make good use of the available peripherals.

INSIDE LINES

Squeezing the juice out

▶ Apple is said to be ahead of schedule in co-developing a new chip set with IBM and Motorola. In fact, it could be selling a new generation of Macintoshes built on the RISC chip technology as early as next year, CFO Joseph Graziano told a group of financial analysts last week. Until now, most experts assumed the Power PC technology would not be available for several years. However, Graziano said, working chips might be available by year's end.

A Kaleida-scope of no's

▶ Sources close to the search for a CEO to head Kaleida, the Apple/IBM multimedia effort, say the companies have approached a number of well-known executives but received thumbs-down. Among those reportedly shaking their head: Trip Hawkins, CEO of electronic game maker Electronic Arts, and Tim Mott, CEO of Macromind, a San Francisco multimedia firm.

Greasing the demand curve

▶ As expected, IBM said it will announce plans this week to bundle OS/2 2.0 with lower end PS/2 models. The firm already intends to deliver PS/1s with OS/2 included. The move would follow the company's disclosure last week that users can order OS/2 via Prodigy, its on-line information service.

Ripping router

▶ The first multiprotocol router vendor to support Asynchronous Transfer Mode "fast" packet-switching technology plans to announce a new architecture next week. Santa Monica, Calif.-based Retix says its new-generation Routerxchange 7000 will incorporate a parallel routing architecture based on five Intel I960 processors running in tandem on one backplane. The processors are tweaked to simultaneously route all protocols supported — OSI, TCP/IP, DECnet IV and V and IPX — at throughput rates equivalent to the network's line speed.

Faster than a speeding FDDI link

▶ DEC is expected next week to announce Gigaswitch, which will act as a high-speed crossroads for DEC's Alpha systems and VAXs, FDDI networks, PC LANs and other vendors' hosts. Based on crossbar switch technology, Gigaswitch can make more than 6 million dynamic connections per second, with a potential aggregate throughput of 3.6G bit/sec. The initial device will support 22 FDDI connections at the full 100M bit/sec. FDDI speed, a 45M bit/sec. long-distance connection and multiprotocol routing.

Scattershot marketing?

▶ At DECworld '92 in Boston last week, Bill Johnson, DEC's vice president of corporate marketing, disclosed that the company has plans to branch out into an additional 10 to 15 industries this year, on top of the 25 to 30 vertical markets to which DEC already caters. Johnson said one of the new markets for DEC will be the cable television sector. He said the company will also attempt to expand its presence in utilities, pharmaceuticals, health care and insurance.

RISCy one-upmanship

▶ In a blatant attempt to upstage the Alpha dog-and-pony show at DECworld, HP stationed its own "RISCworld" van across the street from the World Trade Center's main entrance last week. Inside the van, HP marketing people were available to explain to DECworld attendees why HP's RISC architecture is the best in the business. The van had disappeared by Tuesday afternoon.

Howard Anderson, president of The Yankee Group, poohpoohs the occasionally voiced contention that the software industry is on the wane. "If it's run right, a software industry is a cash machine," he noted at the consultancy's software pricing forum in New York last week. "If it's run wrong, it's still a cash machine. You've got to really screw up for things to be otherwise. But there are people around who can do it." Know any? Phone, fax or CompuServe News Editor Alan Alper at (800) 343-6474; (508) 875-8931 or 76537,2413, respectively. Or try Computerworld*'s 24-hour voice-mail tip line at (508) 820-8555.*

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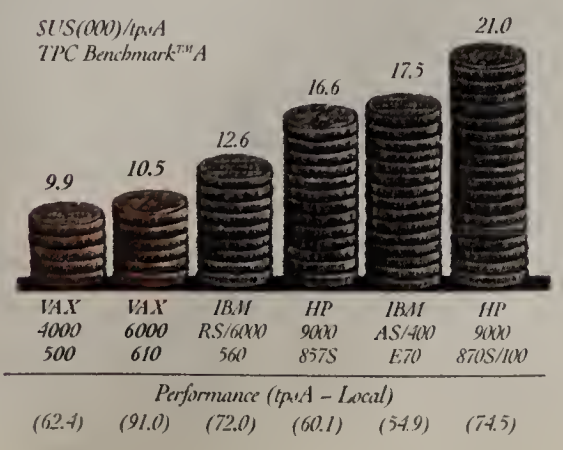

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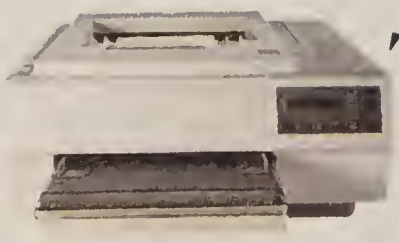

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